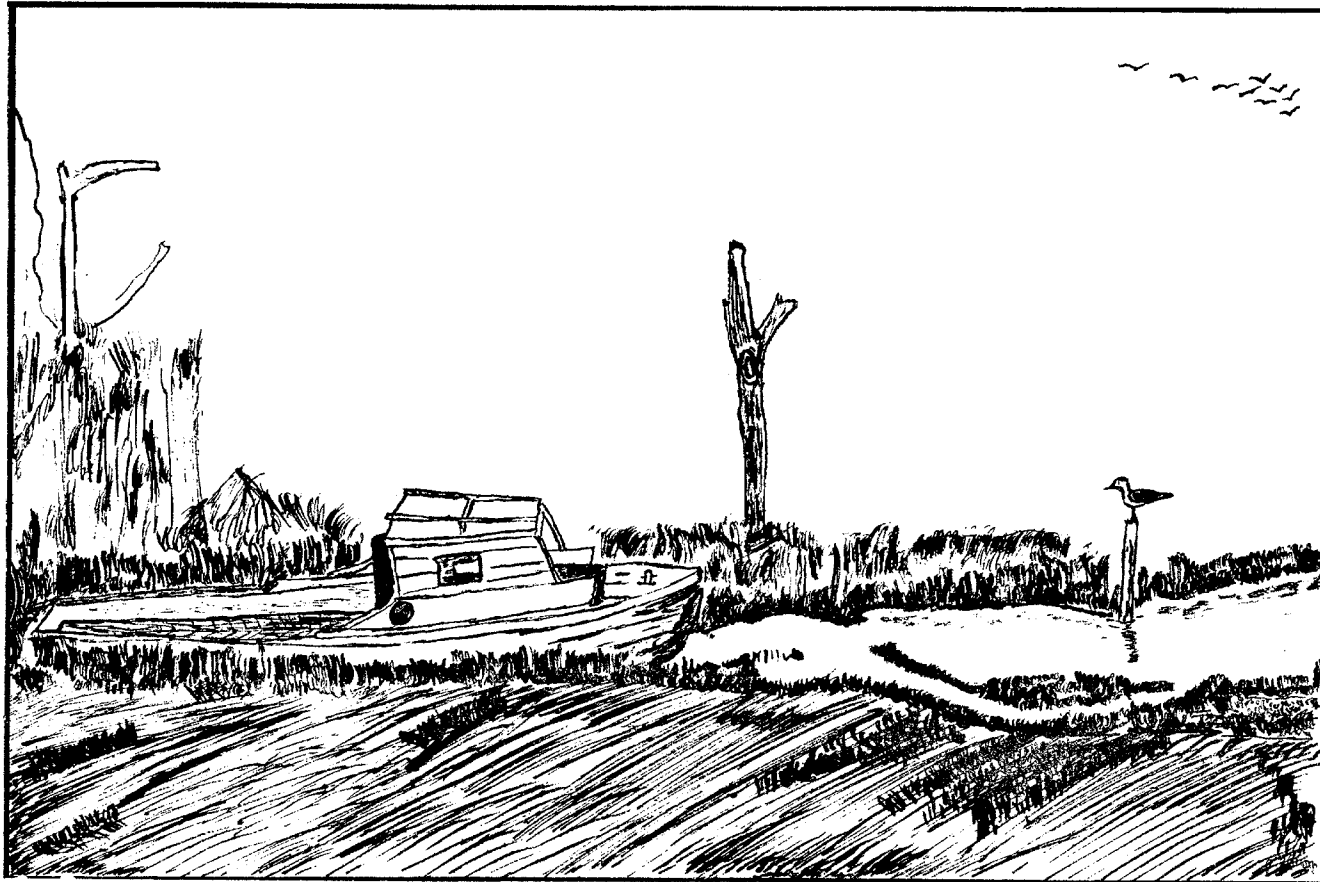


CITY OF VIRGINIA BEACH MARSH INVENTORY

Volume 2. Lynnhaven River, Lake Rudee and Their Tributaries
Special Report No. 217 in Applied Marine Science and Ocean Engineering

Thomas A. Barnard, Jr. and Damon G. Doumlele
G.M. Silberhorn, Project Leader



VIRGINIA INSTITUTE OF MARINE SCIENCE,
SCHOOL OF MARINE SCIENCE, COLLEGE OF
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Gloucester Point, Virginia 23062
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Finally, we are sincerely indebted to Arthur F. Harris, Jr. for the cover drawing, Edward W. Briley for map illustrations, William W. Jenkins for photography, and Carole R. Knox and Nancy E. Hudgins for typing the drafts and final manuscript.

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Introduction

This publication is the second volume of a three-volume series describing the wetlands of the City of Virginia Beach. Volume I, the North Landing River and its Tributaries, was published in September 1976. The report of the marshes of Back Bay will complete the set. This report follows the same basic format as those previously published for other areas. Listed below are the localities for which published inventories are available:

Accomack Co.
Arlington Co.
Caroline Co.
City of Alexandria
City of Fredericksburg
City of Hampton
City of Newport News
City of Virginia Beach (Vol. I)
Essex Co.
Fairfax Co.
Gloucester Co.
James City Co.

King George Co.
Lancaster Co.
Mathews Co.
New Kent Co.
Northampton Co.
Northumberland Co.
Prince William Co.
Spotsylvania Co.
Stafford Co.
Town of Poquoson
Westmoreland Co.
York Co.

Under Section 62.1-13.4 of the Virginia Wetlands Act, the Virginia Institute of Marine Science is obligated to inventory the tidal wetlands of the Commonwealth. This inventory program is designed to assist wetlands boards, cities, counties, planning districts, and other local, state, and federal agencies, as well as the general public and private industry. The basic format used in this series of inventory reports was evolved to specifically address the needs of the above entities in their day-to-day management and planning activities.

The reader may find it helpful to refer to Guidelines for Activities Affecting Virginia Wetlands, Silberhorn, Dawes, and Barnard, 1974, VIMS SRAMSOE No. 46, for information regarding the values and characteristics of the specific marsh communities identified herein. Excerpts from this publication are included in the text below.

The reader is also referred to Tidal Wetland Plants of Virginia, Silberhorn 1976, VIMS Educational Series No. 19, an illustrated manual describing each of the wetland plants listed in the Act. The interested reader will also wish to consult the Shoreline Situation Report, City of Virginia Beach, SRAMSOE No. 163, Virginia Institute of Marine Science, Gloucester Point, Virginia. This publication describes and assesses the City's shoreline with emphasis on shoreline erosion and recommendations concerning the alleviation of the impact of this problem.

The tidal marshes of Virginia Beach, which are included in this report, total 1178 acres. Fifty-one percent of this acreage is vegetated by saltmarsh cordgrass, Spartina alterniflora, the most valuable saltmarsh plant in terms of detritus production. Since much of Virginia Beach's wetlands have been totally or partially destroyed by such activities as bulkheading and filling, every effort should be made to ensure that the remaining areas of this critical resource are properly managed.

Methods

Aerial photographs and topographic maps (USGS) were consulted in order to obtain wetland locations and patterns of marsh vegetation. Marsh community zones and patterns were substantiated by ground truth methods, including observations on foot and by boat. Acreages and wetland boundaries were also estimated by these methods.

Marshes 0.25 acre or larger are designated by number. Many marshes smaller than 0.25 acre (usually narrow fringing marshes) are designated by the same symbol (shaded) as the larger marshes on the section maps but are not identified by number or characterized in the tables. Small marshes (less than one acre) are exaggerated and are not always indicated to scale. Information such as individual marsh acreage, plant species percentage and acreage, marsh type, and other observations are recorded in tabular form. Plant species percentages are recorded to the nearest percent, and acreages to the nearest 0.1 acre. Marshes of less than one acre are recorded to the nearest 0.01 acre. Plant species which occupy less than 10% of a given marsh are noted in the tables as "associated."

This inventory report is organized into six sections, each describing a significant length of shoreline within Virginia Beach. These sections are illustrated individually on 1:24,000 maps after each section description, and collectively on the Reference Map to Wetlands Sections on page 17.

Marsh Types and Evaluation

For a better understanding of what is meant by marsh types, some background information is required. The personnel of the Department of Wetlands Ecology and Environmental Impact Assessment have classified twelve different, common marsh types in Virginia, based on vegetational composition. These marsh types have been evaluated according to certain values and are recorded in the Guidelines report. The following is a brief outline of the wetland types and their evaluation as found in that publication:

"It is recognized that most wetlands areas, with the exception of the relatively monospecific cordgrass marshes of the Eastern Shore, are not homogeneously vegetated. Most marshes are, however, dominated by a major plant. By providing the manager with the primary values of each community type and the means of identification, he then has a useful and convenient tool for weighing the relative importance of each marsh parcel. In Virginia, many wetlands management problems involve only a few acres or a fraction of an acre. The identification of plant communities permits the manager to evaluate both complete marshes and subareas within a marsh.

"Each marsh type may be evaluated in accordance with five general values. These are:

"1. Production and detritus availability. Previous VIMS reports have discussed the details of marsh production and the role of detritus which results when the plant material is washed into the water column. The term "detritus" refers to plant material which decays in the aquatic system and forms the basis of a major marine food web. The term "production" refers to the amount of plant material which is produced by the various types of marsh plants. Vegetative production of the major species has been measured, and marshes have been rated in accordance with their average levels of productivity. If the production is readily available to the marine food web as detritus, a wetlands system is even more important than one of equal productivity where little detritus results. Availability of detritus is generally a function of marsh elevation and total flushing, with detritus more available to the aquatic environment in the lower, well-flushed marshes.

"2. Waterfowl and wildlife utilization. Long before marshes were discovered to be detritus producers, they were known as habitats for various mammals and marsh birds and as food sources for migratory waterfowl. Some marsh types, especially mixed freshwater marshes, are more valuable because of diversity of the vegetation found there.

"3. Erosion buffer. Erosion is a common coastal problem. Marshes can be eroded, but some, particularly the more saline types, are eroded much more slowly than adjacent shores which are unprotected by marsh. This buffering quality is derived from the ability of the vegetation to absorb or dissipate wave energy by establishing a dense root system which stabilizes the substrate. Generally, freshwater species are less effective than saltwater plants in this regard.

"4. Water quality control. The dense growth of some marshes acts as a filter, trapping upland sediment before it reaches waterways and thus protecting shellfish beds and navigation channels from siltation. Marshes can also filter out sediments that are already in the water column. The ability of marshes to filter sediments and maintain water clarity is of particular importance to the maintenance of clam and oyster production. Excessive sedimentation can reduce the basic food supply of shellfish through reduction of the photic zone where algae grow. It can also kill shellfish by clogging their gills. Additionally, marshes can assimilate and degrade pollutants through complex chemical processes, a discussion of which is beyond the scope of this paper..."

"5. Flood buffer. The peat substratum of some marshes acts as a giant sponge in receiving and releasing water. This characteristic is an effective buffer against coastal flooding, the effectiveness of which is a function of marsh type and size.

"Research and marsh inventory work accomplished by VIMS personnel indicate that 10 species of marsh vegetation tend to dominate many marshes, the dominant plant depending on water salinity, marsh elevation, soil type, and other factors. The term "dominant" is construed to mean that at least 50% of the vegetated surface of a marsh is covered by a single species. Brackish and freshwater marshes often have no clearly dominant species of vegetation. These marshes are considered to be highly valuable in environmental terms."

Marsh Types and Their Environmental Contributions

(Edited from Guidelines for Activities Affecting Virginia Wetlands)

Type I Saltmarsh Cordgrass Community

- a. Average yield 4 tons per acre per annum. (Optimum growth up to 10 tons per acre.)
- b. Optimum availability of detritus to the marine environment.
- c. Roots and rhizomes eaten by waterfowl and stems used in muskrat lodge construction. Also serves as nesting material for various birds.
- d. Deterrent to shoreline erosion.
- e. Serves as sediment trap and assimilates flood waters.

Type II Saltmeadow Community

- a. 1-3 tons per acre per annum.
- b. Food (seeds) and nesting areas for birds.
- c. Effective erosion deterrent.
- d. Assimilates flood waters.
- e. Filters sediments and waste material.

Type III Black Needlerush Community

- a. 3-5 tons per acre per annum.
- b. Highly resistant to erosion.
- c. Traps suspended sediments but not as effective as Type II.
- d. Somewhat effective in absorbing flood waters.

Type IV Saltbush Community

- a. 2 tons per acre per annum or less.
- b. Nesting area for small birds and habitat for a variety of wildlife.
- c. Effective trap for flotsam.

Type V Big Cordgrass Community

- a. 3-6 tons per acre per annum.
- b. Detritus less available than from Type I.
- c. Habitat for small animals and used for muskrat lodges.
- d. Effective erosion buffer.
- e. Flood water assimilation.

Type VI Cattail Community

- a. 2-4 tons per acre per annum.
- b. Habitat for birds and utilized by muskrats.
- c. Traps upland sediments.

Type VII Arrow Arum-Pickerel Weed Community

- a. 2-4 tons per acre per annum.
- b. Detritus readily available to marine environment.
- c. Seeds eaten by wood ducks.
- d. Susceptible to erosion from wave action and boat wakes, particularly in winter months.

Type VIII Reed Grass Community

- a. 4-6 tons per acre per annum.
- b. Little value to wildlife except for cover.
- c. Invades marshes and competes with more desirable species.
- d. Deters erosion on disturbed sites.

Type IX Yellow Pond Lily Community

- a. Less than 1 ton per acre per annum.
- b. Cover and attachment site for aquatic animals and algae.
- c. Feeding territory for fish.

Type X Saltwort Community

- a. Less than 0.5 tons per acre per annum.
- b. Little value to aquatic or marsh animals.

Type XI Freshwater Mixed Community

- a. 3-5 tons per acre per annum.
- b. High diversity of wildlife.
- c. High diversity of wildlife foods.
- d. Often associated with fish spawning and nursery grounds.
- e. Ranks high as a sediment trap and nursery grounds.

Type XII Brackish Water Mixed Community

- a. 3-4 tons per acre per annum.
- b. Wide variety of wildlife foods and habitat.
- c. Deterrent to shoreline erosion.
- d. Serves as sediment trap and assimilates flood waters.
- e. Known spawning and nursery grounds for fish.

Evaluation of Wetland Types

(From Guidelines for Activities Affecting Virginia Wetlands)

For management purposes, the twelve types of wetlands identified above are grouped into five classifications based on the estimated total environmental value of an acre of each type.

Group One:

Saltmarsh Cordgrass (Type I)
Arrow Arum-Pickerel Weed (Type VII)
Freshwater Mixed (Type XI)
Brackish Water Mixed (Type XII)

Group One marshes have the highest values in productivity and wildfowl and wildlife utility and are closely associated with fish spawning and nursery areas. They also have high value as erosion inhibitors, are important to the shellfish industry, and are valued as natural shoreline stabilizers. Group One marshes should be perserved.

Group Two:

Big Cordgrass (Type V)
Saltmeadow (Type II)
Cattail (Type VI)

Group Two marshes are of only slightly lesser value than Group One marshes. The major difference is that detritus produced in these marshes is less readily available to the marine environment, due to higher elevations and consequently less tidal action to flush the detritus into adjacent waterways. Group Two marshes have very high values in protecting water quality and acting as buffers against coastal flooding. These marshes should also be preserved, but if development in wetlands is considered to be justified, it would be better to alter Group Two marshes than Group One marshes.

Group Three:

Yellow Pond Lily (Type XI)
Black Needlerush (Type III)

The two marshes in the Group Three category are quite dissimilar in properties. The yellow pond lily marsh is not a significant contributor to the food web, but it does have high values to wildlife and waterfowl. Black needlerush has little wildlife value, but it ranks high as an erosion flood buffer. Group Three marshes are important, though their total values are less than Group One and Two marshes. If development in wetlands is considered necessary, it would be better to alter Group Three marshes than Groups One or Two.

Group Four:

Saltbush (Type IV)

The saltbush community is valued primarily for the diversity and bird nesting area it adds to the marsh ecosystem. To a lesser extent it acts as an erosion buffer. Group Four marshes should not be unnecessarily disturbed, but it would be better to concentrate necessary development in these marshes rather than disturb any of the marshes in the preceding groups.

Group Five:

Saltwort (Type X)
Reedgrass (Type VIII)

Based on present information Group Five marshes have few values of any significance. While Group Five marshes should not be unreasonably disturbed, it is preferable to develop in these marshes than in any other types.

For a better understanding of Virginia's wetlands in general, the Wetlands Act of 1972, and marsh types and their evaluation, the following publications are recommended:

Coastal Wetlands of Virginia Interim Report No. 2
Special Report in Applied Marine Science
and Ocean Engineering No. 27
Kenneth Marcellus, July 1972
Virginia Institute of Marine Science
Gloucester Point, Virginia 23062

Laws of Virginia Relating to Wetlands and
Subaqueous Waters
Virginia Marine Resources Commission
2401 West Avenue
Newport News, Virginia 23607

Wetlands Guidelines
Virginia Marine Resources Commission
2401 West Avenue
Newport News, Virginia 23607

Tidal Wetland Plants of Virginia
Gene M. Silberhorn, April 1976
Educational Series No. 19
Virginia Institute of Marine Science
Gloucester Point, Virginia 23062

Marsh Plants

Common and Scientific Names as Found in the Tables

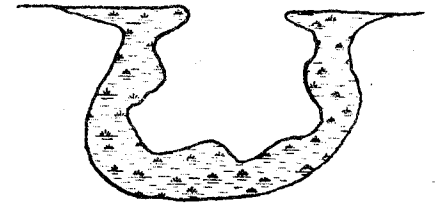
Arrow Arum	<u>Peltandra virginica</u> (L.) Kunth
Aster*	<u>Aster</u> spp.
Bald Cypress	<u>Taxodium distichum</u> (L.) Richard
Big Cordgrass	<u>Spartina cynosuroides</u> (L.) Roth
Black Needlerush	<u>Juncus roemerianus</u> Scheele
Cattail	
Common	<u>Typha latifolia</u> L.
Narrow-leaved	<u>T. angustifolia</u> L.
Jewel Weed*	<u>Impatiens capensis</u> Meerb.
Marsh Hibiscus	<u>Hibiscus moscheutos</u> L.
Marsh Mallow*	<u>Kosteletskyia virginica</u> (L.) Presl
Olney Threesquare	<u>Scirpus olneyi</u> Gray
Panic Grass*	<u>Panicum</u> spp.
Pickerel Weed	<u>Pontederia cordata</u> L.
Reed Grass	<u>Phragmites australis</u> (Cav.) Trin. ex Steud.
Saltbush	
Groundsel Tree	<u>Baccharis halimifolia</u> L.
Marsh Elder	<u>Iva frutescens</u> L.
Saltgrass Meadow	
Saltgrass	<u>Distichlis spicata</u> (L.) Greene
Saltmeadow Hay	<u>Spartina patens</u> (Ait.) Muhl.
Saltmarsh Bulrush	<u>Scirpus robustus</u> Pursh
Saltmarsh Cordgrass	<u>Spartina alterniflora</u> Loisel.
Saltmarsh Fimbristylis*	<u>Fimbristylis spadicea</u> (L.) Vahl
Saltwort	<u>Salicornia</u> spp.
Sea Lavender	<u>Limonium</u> spp.
Sea Oxeye	<u>Borrichia frutescens</u> (L.) DC.
Smartweed	<u>Polygonum</u> spp.
Switch Grass	<u>Panicum virgatum</u> L.
Water Hemp	<u>Amaranthus cannabinus</u> (L.) J.D. Sauer
Waterdock	<u>Rumex verticillatus</u> L.
Wax Myrtle	<u>Myrica cerifera</u> L.

*Species not included in the Virginia Wetlands Act of 1972

Glossary of Descriptive Terms

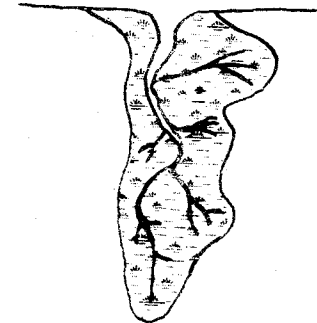
Cove Marsh

A marsh contained within a concavity or recessed area on a shoreline. The marsh vegetation is usually found surrounding a central, open-water pond, and tidal flushing is permitted through an inlet.



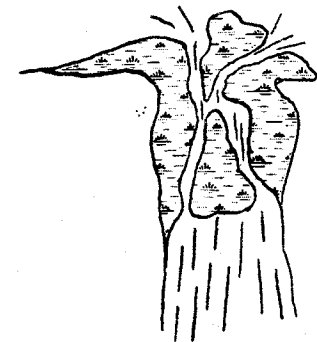
Creek or Embayed Marsh

A marsh occupying a drowned creek valley. In many large creek marshes the salinity decreases headward; this type of marsh may be divided for inventory purposes into sections if significant changes in the plant community occur along its length.



Delta Marsh

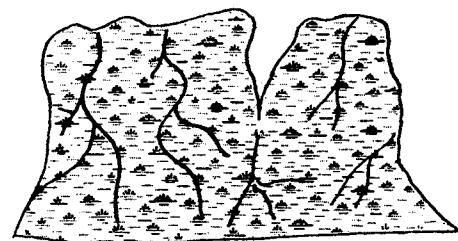
A marsh growing on sediment deposited at the mouth of a tidal creek. Tidal exchange through the creek mouth is usually restricted to narrow channels by the marsh.



Glossary of Descriptive Terms

Extensive Marsh

A large marsh where the length and depth or width are roughly comparable. Most extensive marshes are drained by many tidal channels and creeks which have little freshwater input.



Fringe Marsh

A marsh which borders a section of shoreline and generally has a much greater length than width or depth.



High Marsh

The marsh surface is at an elevation of mean high water or above; it is usually inundated less than twice daily by tidal action.

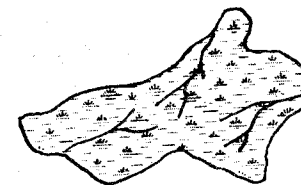
Low Marsh

The marsh surface is at an elevation below mean high water; it is usually inundated twice daily by tidal action.

Glossary of Descriptive Terms

Marsh Island

An isolated marsh surrounded on all sides by open water. Interior portions of the marsh may contain trees scattered at highest elevations.



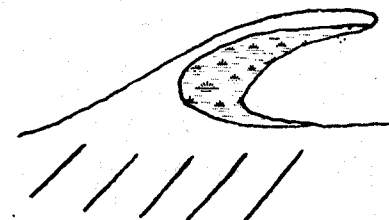
Pocket Marsh

A marsh contained within a small, essentially semi-circular area on a shoreline.

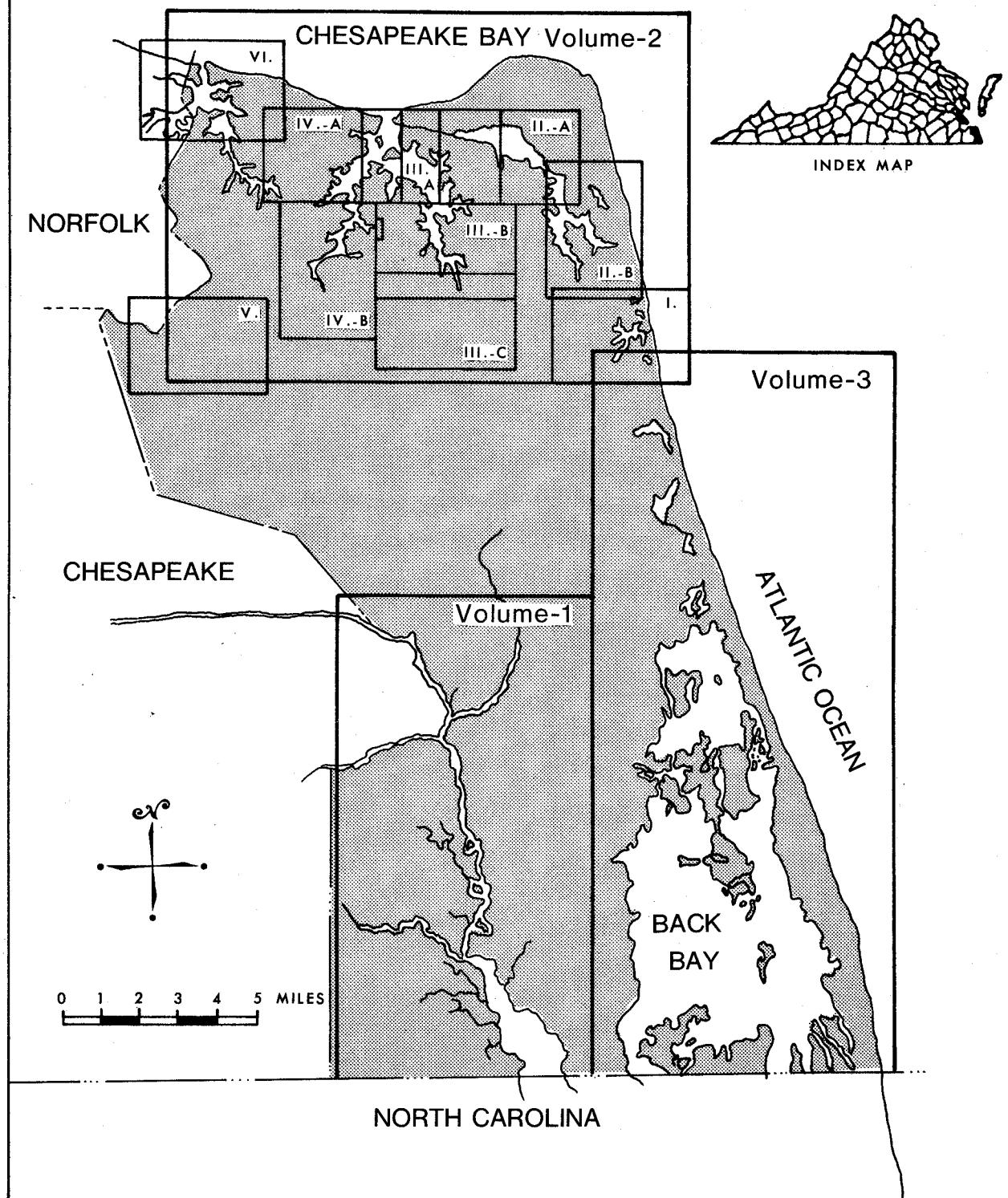


Point or Spit Marsh

A marsh which extends from the uplands in the form of a point or spit. Its development is usually influenced by tidal currents that form a sand berm behind which the marsh forms.



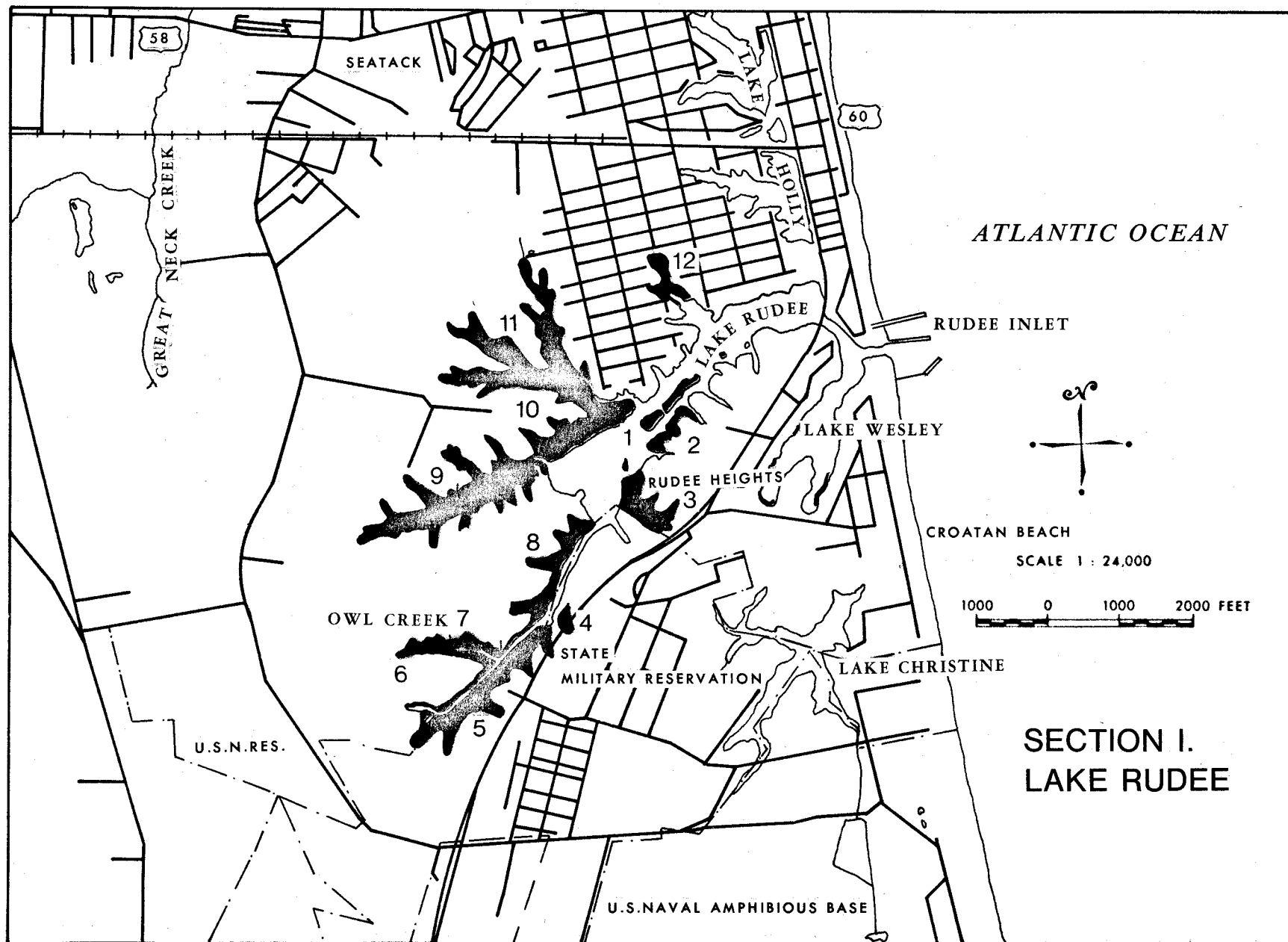
REFERENCE MAP TO
WETLAND SECTIONS
City of Virginia Beach



Section I

Lake Rudee

Lake Rudee is actually a creek with a somewhat restricted tidal connection with the Atlantic Ocean via Rudee Inlet. The downstream section is heavily utilized by boats and is also extensively bulkheaded; hence, marshes are few. In contrast, the less populated upstream portion contains some moderately large creek marshes dominated by saltmarsh cordgrass (Spartina alterniflora), with lesser amounts of saltmeadow grasses (S. patens and Distichlis spicata) and cattails (Typha spp.). These marshes are particularly valuable as sediment traps, filtering out suspended sediment in runoff waters as well as in the creek itself. They are also important detritus producers, erosion buffers and wildlife habitat.



SECTION I. LAKE RUDEE

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
1	Lake Rudee	2.3	100	2.30											Marsh island	I
2	Lake Rudee	0.25	20	0.05			70	0.18	10	0.02					Fringe marsh	II
3	Lake Rudee	6.3	80	5.04			10	0.63	10	0.63					Portion of marsh displaced by boat ramp and parking	I
4	Owl Creek	0.75	60	0.45			20	0.15	10	0.08			10	d 0.08		I
5	Owl Creek	12.0	70	8.40			20	2.40					10	d 1.2	Marsh also contains scattered panic and reed grasses	I
6	Owl Creek	5.4					60	3.24	10	0.54			30	d 1.62	Some saltmarsh cordgrass present	II
7	Owl Creek	2.3	60	1.38			40	0.92							Scattered saltbush present	I
8	Owl Creek	7.5	80	6.0			20	1.5							Cattail and saltbush also present	I
9	Lake Rudee	22.6	80	18.08			10	2.26					10	d 2.26	Cattail heavily concentrated at head of creek	I
10	Lake Rudee	12.0	80	9.60			20	2.40							Fringe marsh, scattered saltbush	I
11	Lake Rudee	28.6	90	25.74	assoc		assoc		assoc				10	d 2.86	Extensive creek marsh	I
12	Lake Rudee	3.4	90	3.06			10	0.34							Pocket marsh, scattered saltbush	I
	Total Section I	103.4	77	80.1	assoc		14	14.02	1	1.27			8	8.02		

Sa = Saltmarsh Cordgrass
 Jr = Black Needlerush
 Md = Saltgrass Meadow
 Sb = Saltbushes
 Sc = Big Cordgrass

a = Saltmarsh Bulrush
 b = Saltmarsh Fleabane
 c = Saltmarsh Aster
 d = Cattail
 e = Marsh Hibiscus

f = Water Hemp
 g = Switch Grass
 h = Foxtail Grass
 i = Arrow Arum
 j = Pickerel Weed

k = Reed Grass
 l = Olney Threesquare
 m = Marsh Mallow
 n = Saltmarsh Loosestrife
 o = Smartweed

p = Wild Rice
 q = Sea Lavender
 r = Marsh Pink
 s = Saltwort
 t = Yellow Pond-lily

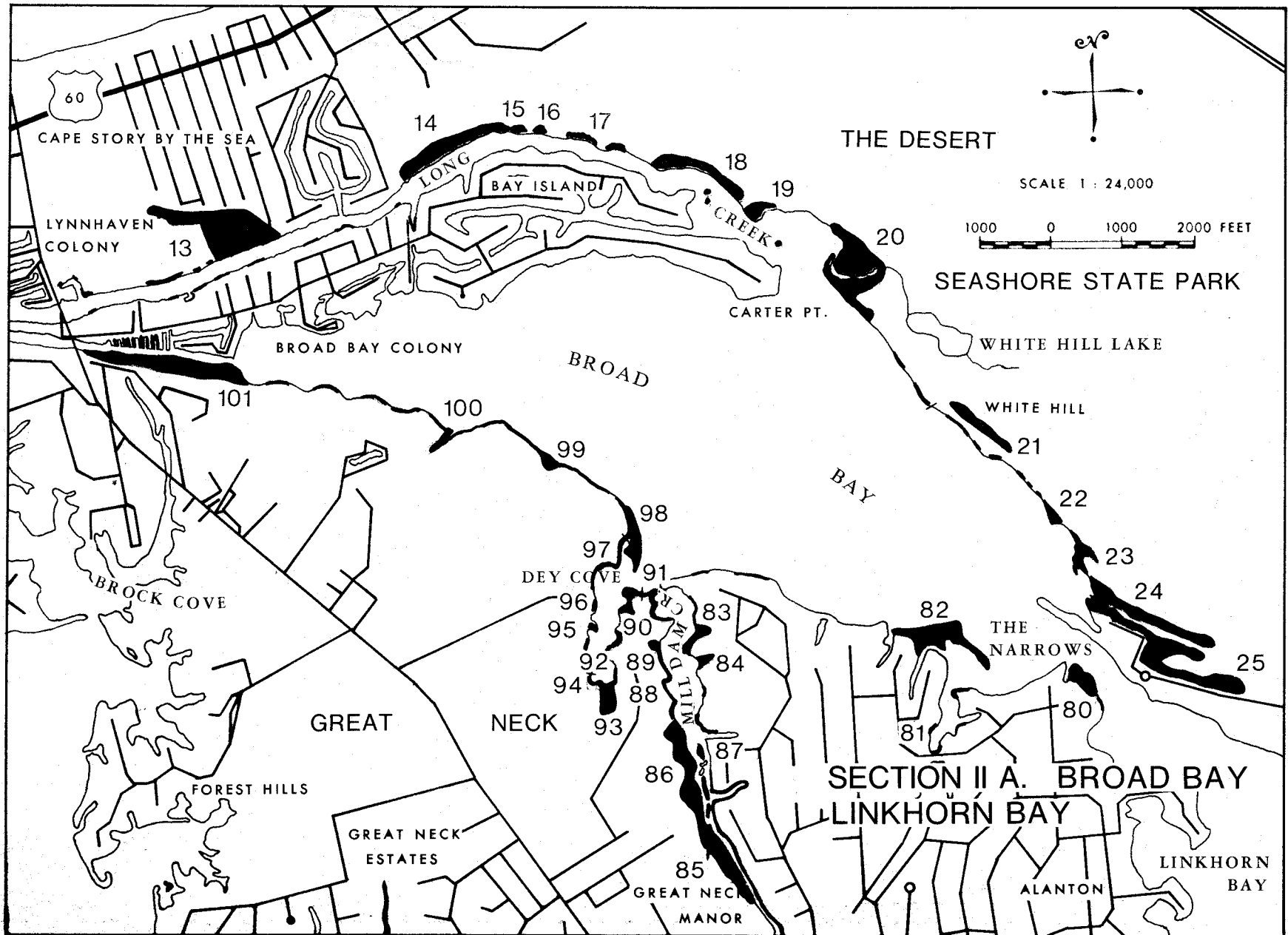
Section II

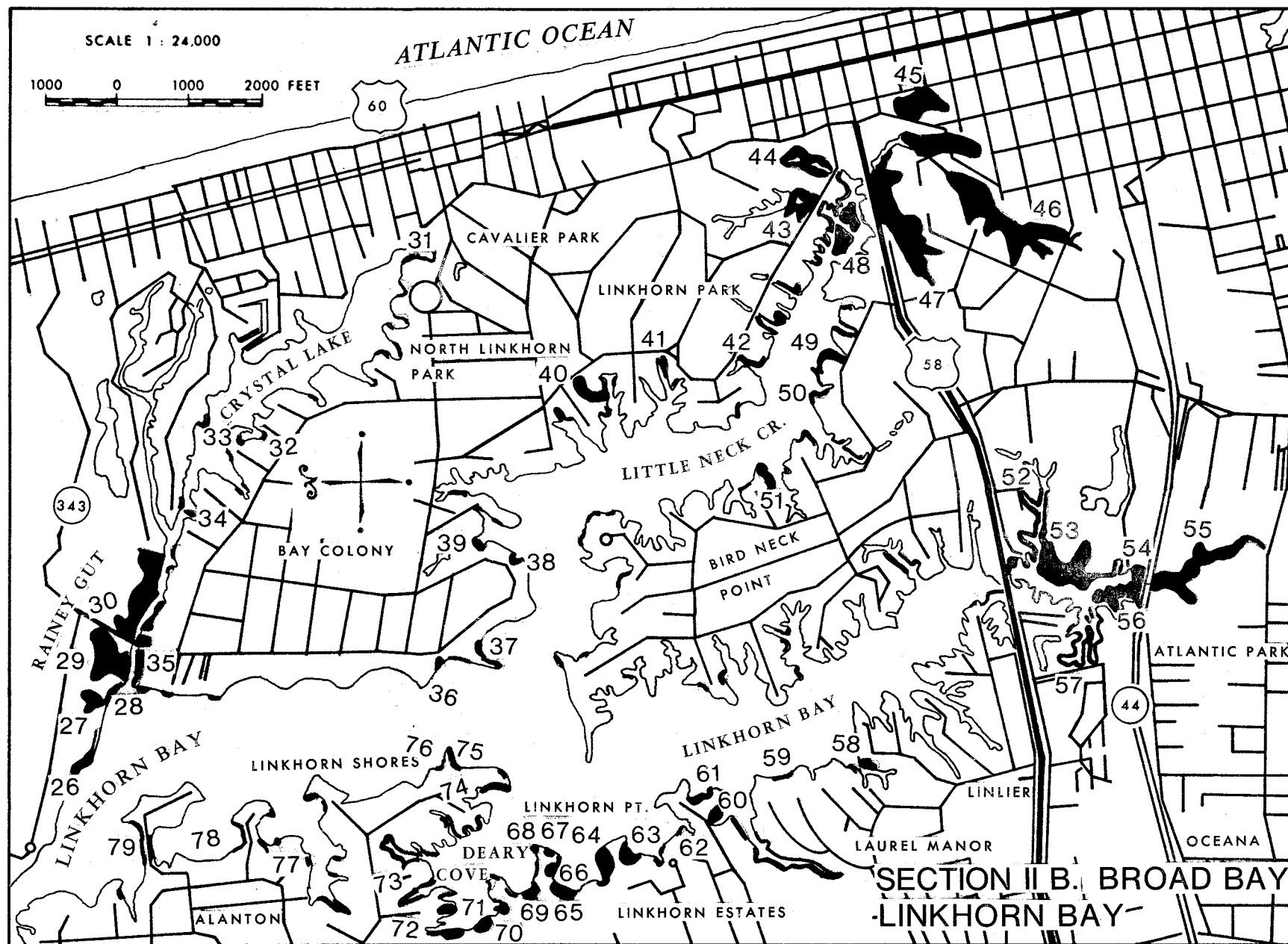
Broad Bay-Linkhorn Bay

Broad Bay, Linkhorn Bay, and their tributaries encompass a variety of marsh types and configurations. Marshes of Broad Bay, with the exception of Broad Bay Colony, are largely undisturbed and range from typical fringe and pocket marshes to long, straight creek marshes in old dune swales. Linkhorn Bay and its tributaries, Little Neck Creek and Crystal Lake, are highly developed and extensively bulkheaded. Marshes here are mostly limited to small fringes and pockets, with larger creek marshes in the upstream sections.

Four marsh plants almost equally codominate this section: saltmarsh cordgrass, saltmeadow grasses, black needlerush (Juncus roemerianus), and saltbushes (Iva frutescens and Baccharis halimifolia). In many marshes none of these plants are clearly dominant, and the marshes are classified as Brackish Water Mixed (Type XII) communities.

Although many of the marshes of this section are small fringes, they nevertheless function as effective erosion deterrents and habitat and thus make a significant contribution both in terms of human and aquatic ecology.





SECTION II. BROAD BAY-LINKHORN BAY

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
13	Long Creek	12.7	70	8.89	20	2.54	assoc		assoc				10	c, s 1.27	Extensive marsh, ditched for mosquito control	I
14	Long Creek	5.3	20	1.06	80	4.24									Saltbushes, meadow grasses, and cattails associated	III
15	Long Creek	0.25	20	0.05	80	0.2									Pocket marsh with saltbush, meadow grasses and cattails	III
16	Long Creek	0.25	20	0.05	80	0.2									Pocket marsh	III
17	Long Creek	1.0	20	0.20	80	0.80									Broad fringe marsh	III
18	Long Creek	5.2	10	0.52	90	4.68									Broad fringe marsh with cat- tails and meadow grasses also	III
19	Long Creek	1.8	10	0.18	80	1.44	10	0.18								III
20	Broad Bay	12.2	10	1.22	90	10.98	assoc		assoc		assoc				Also contains scattered mallow	III
21	Broad Bay	2.0	60	1.2			40	0.8							Needlerush and saltbush assoc- iated	I
22	Broad Bay	1.0	60	0.6			40	0.4							Scattered saltbush	I
23	Broad Bay	1.7	10	0.17	20	0.34	40	0.68	30	0.51						XII
24	Broad Bay	3.4	20	0.68	60	2.04	20	0.68							Scattered saltbush and sea lavender	III
25	The Narrows	10.6	20	2.12	40	4.24	30	3.18	assoc				10	f, wax myrtle 1.06	Marsh located between relict beach ridges	XII
26	The Narrows	0.5	10	0.05	60	0.30	10	0.05	20	0.1					Pocket marsh	III

Sa = Saltmarsh Cordgrass
Jr = Black Needlerush
Md = Saltgrass Meadow
Sb = Saltbushes
Sc = Big Cordgrass

a = Saltmarsh Bulrush
b = Saltmarsh Fleabane
c = Saltmarsh Aster
d = Cattail
e = Marsh Hibiscus

f = Water Hemp
g = Switch Grass
h = Foxtail Grass
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m = Marsh Mallow
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SECTION II. BROAD BAY-LINKHORN BAY

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
27	The Narrows	0.5	30	0.15	10	0.05	40	0.2	20	0.1					Pocket marsh	XII
28	Rainey Gut	0.25	10	0.02			60	0.15	20	0.05			10	k 0.02	Fringe marsh	II
29	Rainey Gut	5.7	20	1.14	20	1.14	40	2.28	20	1.14					Extensive ditching in marsh	XII
30	Rainey Gut	5.6	10	0.56	30	1.68	40	2.24	20	1.12						XII
31	Crystal Lake	0.25	80	0.2			20	0.05							Fringe marsh with needlerush and saltbush associated	I
32	Crystal Lake	0.25	30	0.08			60	0.15	10	0.02					Pocket marsh with saltmarsh fimbristylis associated	II
33	Crystal Lake	0.25	80	0.2			20	0.05							Pocket marsh with scattered saltbush at upland margin	I
34	Crystal Lake	0.25	30	0.08			50	0.13	20	0.05					Marsh island	II
35	Rainey Gut	2.4	70	1.68	assoc		20	0.48	assoc				10	d 0.24	Marsh disturbed by dredged access channels	I
36	Linkhorn Bay	0.25	10	0.02			40	0.1	50	0.13					Pocket marsh	IV
37	Little Neck Creek	0.5	60	0.3	10	0.05	20	0.1	10	0.05					Broad fringe marsh	I
38	Little Neck Creek	0.5	30	0.15	30	0.15	30	0.15	10	0.05					Pocket marsh	XII
39	Little Neck Creek	0.5	40	0.2	40	0.2	20	0.1							Cove marsh with cattail and saltbush associated	XII
40	Little Neck Creek	0.75	10	0.08			40	0.3	50	0.38					Pocket marsh	IV

Sa = Saltmarsh Cordgrass
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SECTION II. BROAD BAY-LINKHORN BAY

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
41	Little Neck Creek	0.25	50	0.13			10	0.02	40	0.1						I
42	Little Neck Creek	0.25	80	0.2					20	0.05						I
43	Little Neck Creek	3.2	10	0.32			50	1.60	40	1.28	assoc				High marsh both sides of road	II
44	Little Neck Creek	4.2	assoc				40	1.68	60	2.52	assoc				Extensive high marsh	IV
45	Little Neck Creek	4.0	35	1.4			25	1.0	40	1.6	assoc			a,d,f	More open water than shown, Marsh is trapping debris	XII
46	Little Neck Creek	16.7	10	1.67			30	5.01	50	8.35	10	1.67		k	Extensive high marsh gradually being filled	IV
47	Little Neck Creek	7.8	assoc				30	2.34	60	4.68	10	0.78		k	Marsh highly disturbed by fill activities	IV
48	Little Neck Creek	3.3	50	1.65	assoc		10	0.33	40	1.32					Two marsh islands	I
49	Little Neck Creek	0.5	90	0.45					10	0.05					Broad fringe with black needlerush associated	I
50	Little Neck Creek	0.25	80	0.2			10	0.02	10	0.02					Broad fringe marsh	I
51	Little Neck Creek	0.5	50	0.25	30	0.15	10	0.05	10	0.05						I
52	Linkhorn Bay	0.5	30	0.15	assoc		30	0.15	30	0.15			10	k 0.05	Wide fringe marsh	XII
53	Linkhorn Bay	7.3	assoc		10	0.73	60	4.38	20	1.46			10	k 0.73		II
54	Linkhorn Bay	0.5	40	0.2			10	0.05	50	0.25					Scattered water hemp present	IV

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SECTION II. BROAD BAY-LINKHORN BAY

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
55	Linkhorn Bay	5.0	20	1.0			30	1.5	50	2.5					High marsh with reed grass, water hemp and cattail present	IV
56	Linkhorn Bay	3.1	10	0.31			40	1.24	50	1.55					Water hemp present	IV
57	Linkhorn Bay	0.5	30	0.15			30	0.15	40	0.20					Marsh islands	XII
58	Linkhorn Bay	0.25	20	0.05			60	0.15	20	0.05					Scattered needlerush present	II
59	Linkhorn Bay	0.25	20	0.05	10	0.02	50	0.12	20	0.05						II
60	Linkhorn Point	0.5	50	0.25	30	0.15	10	0.05	10	0.05					Cove marsh with scattered water hemp and saltmarsh bulrush	I
61	Linkhorn Point	1.0	80	0.8			10	0.1	10	0.1					Cove marsh with scattered water hemp and needlerush	I
62	Linkhorn Bay	0.25	60	0.15			30	0.08	10	0.02					Fringe marsh	I
63	Linkhorn Bay	1.5			70	1.05	20	0.30	10	0.15					Pocket marsh with scattered saltmarsh cordgrass	III
64	Linkhorn Bay	1.5	20	0.30	60	0.90	10	0.15	10	0.15					Pocket marsh	III
65	Linkhorn Bay	1.0	30	0.3			50	0.5	20	0.2					Pocket marsh	II
66	Linkhorn Bay	0.75	20	0.15	60	0.45	10	0.08	10	0.08					Pocket marsh	III
67	Linkhorn Bay	0.75			80	0.60	20	0.15							Pocket marsh with scattered saltbush & saltmarsh cordgrass	III
68	Deary Cove	0.25			40	0.1	60	0.15							Spit marsh with saltbush and saltmarsh cordgrass associated	II

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SECTION II. BROAD BAY-LINKHORN BAY

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
69	Deary Cove	2.0	20	0.4	30	0.6	40	0.8	10	0.2					Pocket marsh	XII
70	Deary Cove	1.5	20	0.3	30	0.45	50	0.75							Pocket marsh with scattered saltbush	II
71	Deary Cove	1.0	10	0.1	30	0.3	40	0.4	20	0.2					Pocket marsh	XII
72	Deary Cove	3.0	10	0.3	30	0.9	40	1.2	20	0.6						XII
73	Deary Cove	1.0	10	0.1	70	0.7	20	0.2							Pocket marsh with scattered saltbush	III
74	Deary Cove	0.25	20	0.05	20	0.05	40	0.1	20	0.05					Fringe marsh	XII
75	Linkhorn Bay	0.5	20	0.1	20	0.1	40	0.2	20	0.1					Fringe marsh	XII
76	Linkhorn Bay	0.25	10	0.02			90	0.23							Fringe marsh	II
77	Linkhorn Bay	0.25	30	0.08			70	0.18							Pocket marsh with scattered water hemp	II
78	Linkhorn Bay	0.25	70	0.18			20	0.05	10	0.02					Fringe marsh	I
79	Linkhorn Bay	0.25	40	0.1			40	0.1	20	0.05					Fringe marsh with panic grass and needlerush associated	XII
80	The Narrows	2.0	10	0.2	20	0.4	40	0.8	30	0.6						XII
81	Broad Bay	0.25	60	0.15	30	0.08	10	0.02							Fringe marsh	I
82	Broad Bay	6.0	20	1.2	20	1.2	30	1.8	20	1.2	assoc		10	k 0.6	Extensive spit marsh. Dredge spoil along upland margin	XII

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SECTION II. BROAD BAY-LINKHORN BAY

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
83	Mill Dam Creek	0.5	30	0.15	70	0.35									Pocket marsh	III
84	Mill Dam Creek	0.5	40	0.2	60	0.3									Pocket marsh with cattail, saltbush and meadow grasses	III
85	Mill Dam Creek	1.8	30	0.54	assoc		30	0.54	30	0.54			10	f,d,o 0.18	Freshwater plants including bald cypress at head of creek	XII
86	Mill Dam Creek	4.8	30	1.44	50	2.4	20	0.96							Portion of marsh along upland has been previously filled	III
87	Mill Dam Creek	1.0	90	0.9					10	0.1					Marsh islands with needlerush and meadow grasses present	I
88	Mill Dam Creek	0.25	100	0.25											Pocket marsh with scattered saltbush and needlerush	I
89	Mill Dam Creek	0.25	100	0.25											Pocket marsh with scattered saltbush	I
90	Mill Dam Creek	1.0	30	0.3	20	0.2	20	0.2	30	0.3					Fringe and spit marsh	XII
91	Dey Cove	1.0	50	0.5	10	0.1	10	0.1	30	0.3						I
92	Dey Cove	0.25	80	0.2			10	0.02	10	0.02					Pocket marsh	I
93	Dey Cove	1.8	30	0.54	60	1.08			10	0.18					Creek marsh	III
94	Dey Cove	0.25	70	0.18	10	0.02	10	0.02	10	0.02					Fringe marsh	I
95	Dey Cove	0.25	70	0.18			10	0.02	20	0.05					Spit marsh	I
96	Dey Cove	0.5	40	0.2	10	0.05	40	0.2	10	0.05					Meadow portion being mowed	XII

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SECTION II. BROAD BAY-LINKHORN BAY

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
97	Dey Cove	0.25	80	0.2	10	0.02			10	0.02					Fringe marsh	I
98	Dey Cove	2.0	30	0.6	50	1.0	10	0.2	10	0.2					Cove marsh with two species of saltwort	III
99	Borad Bay	0.25	assoc				70	0.18	30	0.08					Cove marsh with scattered salt-marsh bulrush, water hemp	II
100	Broad Bay	0.5	70	0.35			30	0.15						d,f	Some marsh appears to be reestablishing after being dredged	I
101	Broad Bay	8.2	80	6.56			10	0.82	assoc				10	d,f,l,k,m 0.82	Saltmarsh bulrush also in this extensive broad fringe	I
	Total Section II	185.55	26	48.9	27	49.72	24	44.04	19	35.56	1	2.45	3	4.97		

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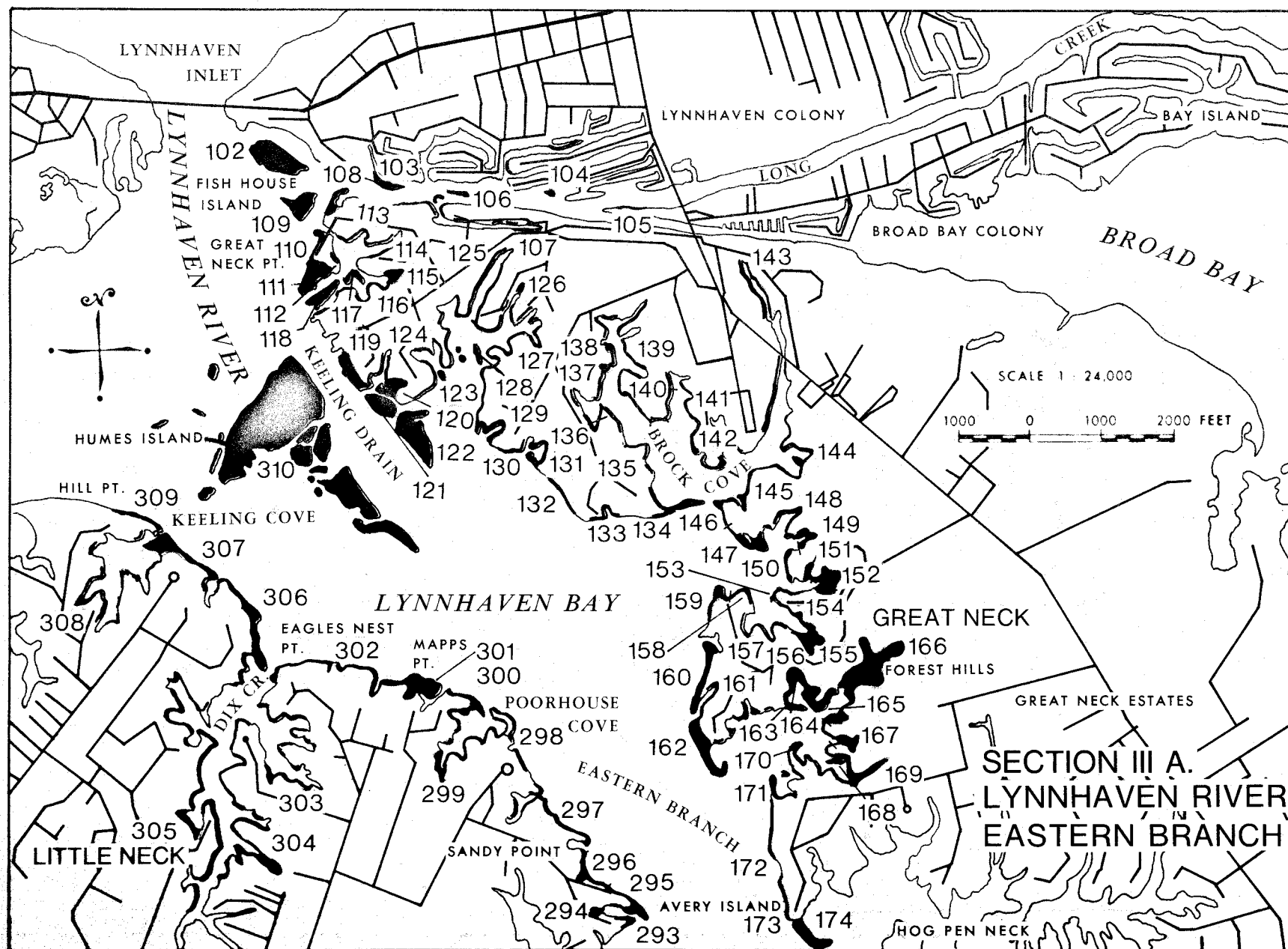
p = Wild Rice
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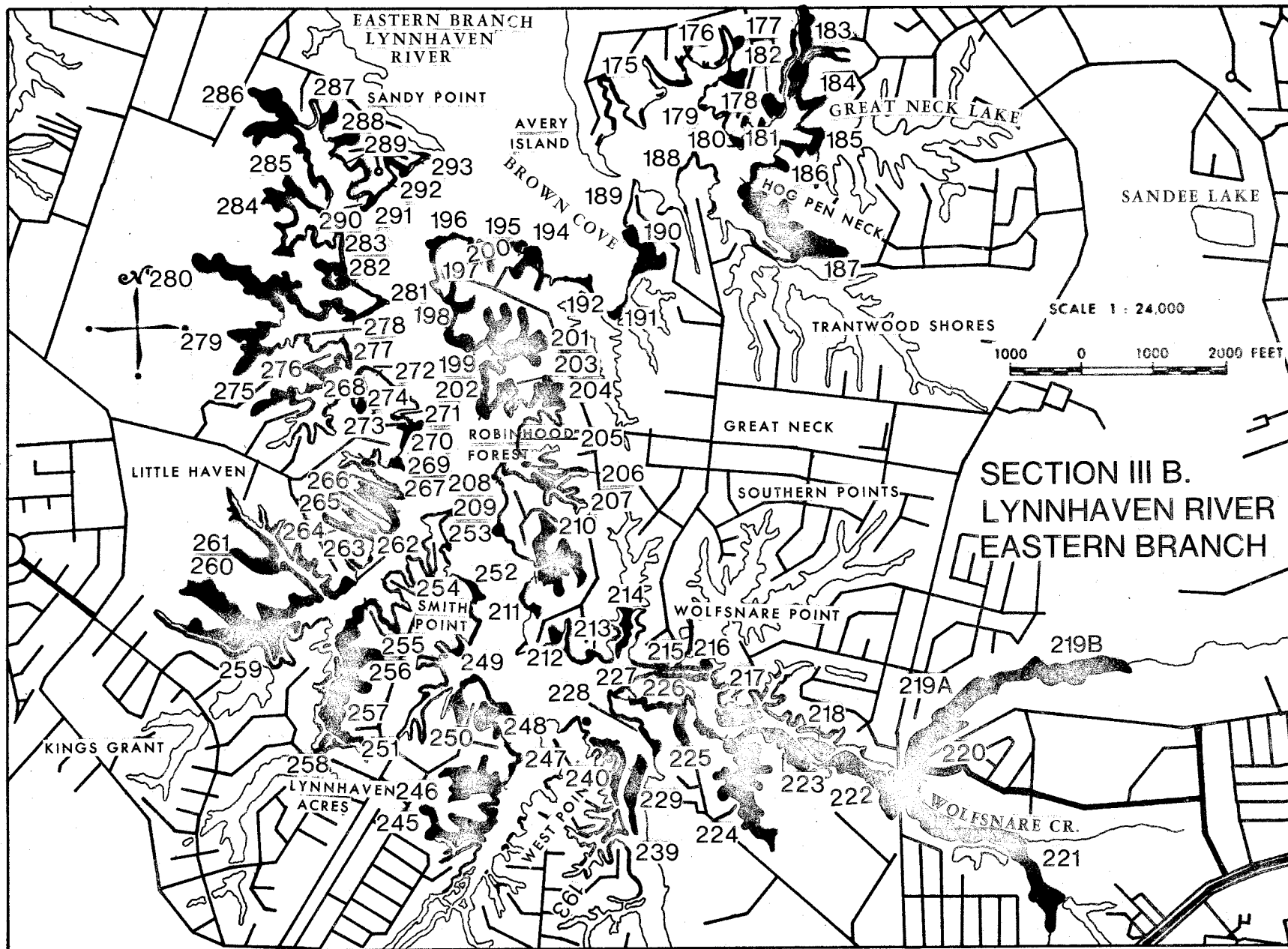
Section III

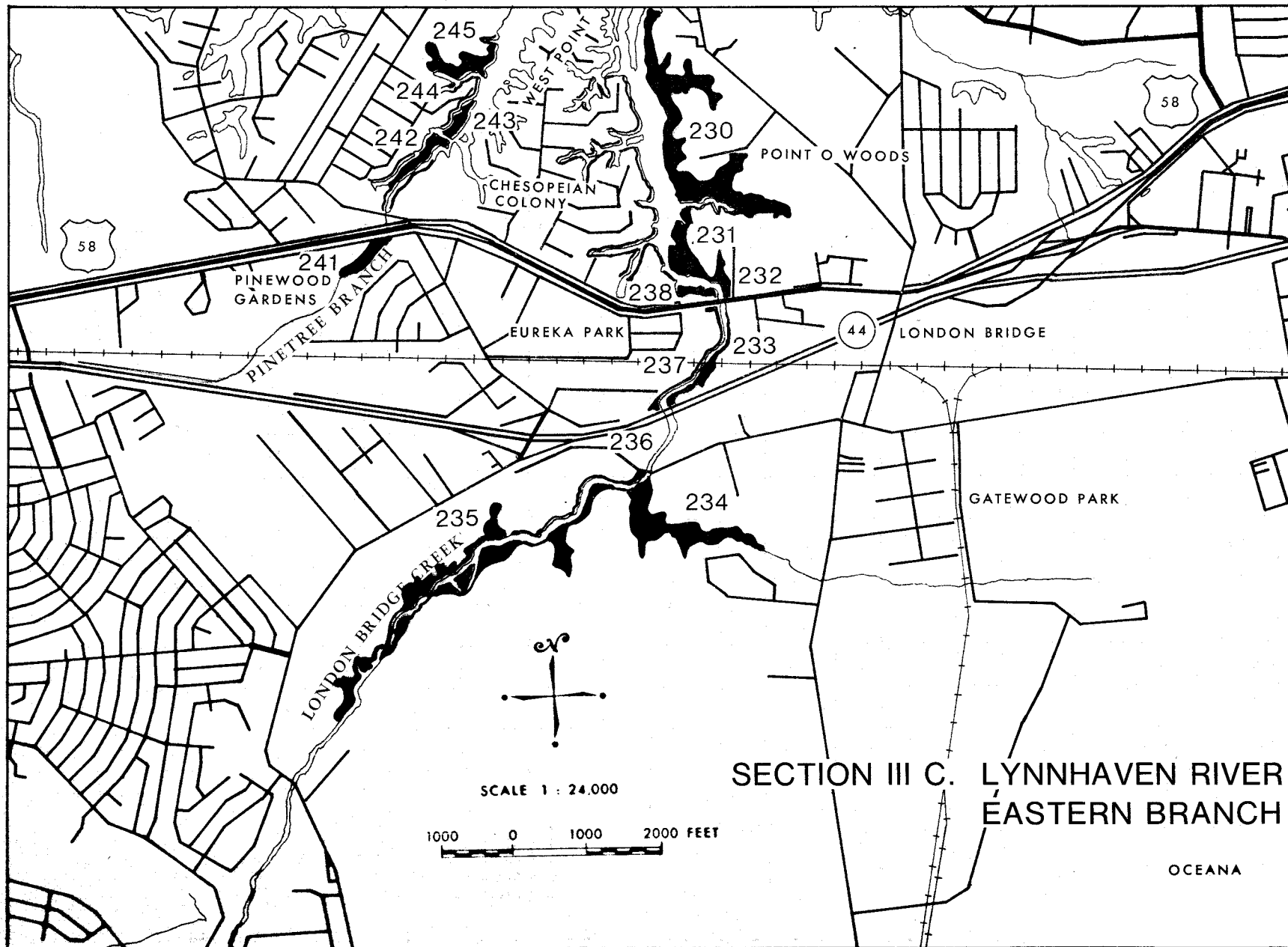
Lynnhaven River, Eastern Branch

This section contains about one half of the marshes and over one third of the total marsh acreage of this inventory. Most of the marshes along this mostly residential shoreline are small pockets and fringes composed largely of saltmarsh cordgrass. These fringes are important deterrents to erosion by boat wakes and also function as habitat, upland runoff filters and detritus producers.

The upper portion of Wolfsnare Creek (No. 219B) is unique in that it contains the only freshwater mixed (Type XI) marsh in the area described in this publication.







SECTION III. LYNNHAVEN RIVER, EASTERN BRANCH

#	PLACE NAME	ACRES	Sa % ACRES		Jr % ACRES		Md % ACRES		Sb % ACRES		Sc % ACRES		OTHER % ACRES		OBSERVATIONS	MARSH TYPE
102	Lynnhaven Inlet	5.0	90	4.5			10	0.5	assoc					q	Low marsh island with sea oxeye also present.	I
103	Long Creek	0.5	90	0.45			10	0.05							Spit marsh. Also contains scattered saltbush.	I
104	Long Creek	0.25	100	0.25											Marsh island with some saltbush.	I
105	Long Creek	0.25	60	0.15			30	0.08					10	Sea oxeye 0.02	Fringe marsh.	I
106	Long Creek	0.25	90	0.23			10	0.02	assoc						Two marsh islands with sea oxeye and switch grass.	I
107	Long Creek	0.5	100	0.5											Fringe marsh at head of canal.	I
108	Lynnhaven Bay	0.5	50	0.25			30	0.15					20	Sea oxeye 0.1	Broad fringe and spit marsh.	I
109	Lynnhaven Bay	2.6	90	2.34	assoc		assoc		assoc				10	C 0.26	Low marsh island with sea oxeye also present.	I
110	Great Neck Point	1.0	90	0.9					assoc				10	Sea oxeye 0.1	Scattered aster, saltwort, panic grass and sea lavender.	I
111	Great Neck Point	0.5	20	0.1			70	0.35					10	Sea oxeye 0.05	Pocket marsh.	II
112	Great Neck Point	0.25	80	0.2			20	0.05							Fringe marsh.	I
113	Great Neck Point	0.5	80	0.4			20	0.1							Fringe marsh.	I
114	Great Neck Point	0.25	80	0.2			20	0.05							Fringe marsh.	I
115	Great Neck Point	0.5	100	0.5			assoc		assoc						Pocket marsh.	I

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SECTION III. LYNNHAVEN RIVER, EASTERN BRANCH

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
116	Great Neck Point	0.25	100	0.25					assoc						Fringe marsh	I
117	Great Neck Point	0.5	100	0.5											Marsh island	I
118	Great Neck Point	1.0	80	0.8	assoc.		10	0.1	assoc.				10	c,k,q 0.1	Old spoil on marsh island; sea oxeye also present	I
119	Keeling Drain	1.0	100	1.0			assoc.		assoc.						Broad fringe with sea oxeye	I
120	Keeling Drain	0.8	90	0.72	assoc				10	0.08			assoc	c	Some marsh previously filled. Sea oxeye present in marsh	I
121	Keeling Drain	2.8	100	2.8											Marsh island has some brackish marsh species present	I
122	Keeling Drain	4.9	100	4.9											Marsh island with sparsely scattered brackish water species	I
123	Lynnhaven River	0.25	100	0.25											Marsh island with old spoil in middle. Saltbush and sea oxeye	I
124	Lynnhaven River	0.25	100	0.25											2 marsh islands	I
125	Lynnhaven River	0.5	100	0.5											Fringe marsh with scattered saltbush and aster	I
126	Lynnhaven River	0.5	100	0.5											Pocket marsh	I
127	Lynnhaven River	0.25	100	0.25											Marsh fringe averages five feet wide	I
128	Lynnhaven River	0.6	90	0.54	5	0.03			5	0.03					Marsh island with scattered sea oxeye also	I
129	Lynnhaven River	1.0	80	0.8			10	0.1	10	0.1					Pocket and spit marsh with aster and sea oxeye	I

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SECTION III. LYNNHAVEN RIVER, EASTERN BRANCH

#	PLACE NAME	ACRES	Sa % ACRES		Jr % ACRES		Md % ACRES		Sb % ACRES		Sc % ACRES		OTHER % ACRES		OBSERVATIONS	MARSH TYPE
130	Lynnhaven River	0.25	80	0.2			20	0.05							Fringe marsh averaging 8 feet wide. Saltbush & sea oxeye	I
131	Lynnhaven River	1.0	80	0.8			10	0.1	10	0.1					Cove marsh. Some needlerush	I
132	Lynnhaven River	0.25	100	0.25											Fringe marsh with some saltbush in higher areas	I
133	Lynnhaven River	0.25	100	0.25											Fringe marsh with some saltbush in higher areas	I
134	Brock Cove	2.0	60	1.2	10	0.2	10	0.2	10	0.2			10	Sea oxeye 0.2	Fringe and spit marsh with saltmarsh aster present	I
135	Brock Cove	0.25	90	0.23					10	0.02					Fringe marsh	I
136	Brock Cove	0.25	90	0.23	10	0.02									Fringe marsh	I
137	Brock Cove	0.25	100	0.25			assoc		assoc					c	Fringe and pocket marsh	I
138	Brock Cove	0.5	100	0.5			assoc		assoc					c,q	Pocket marsh	I
139	Brock Cove	0.5	60	0.3			10	0.05	30	0.15					Broad fringe with scattered saltmarsh aster	I
140	Brock Cove	0.5	100	0.5	assoc				assoc				assoc	c	Fringe marsh	I
141	Brock Cove	0.25	80	0.2			10	0.02	assoc				10	c,q 0.02	Fringe marsh	I
142	Brock Cove	0.5	90	0.45	10	0.05									Fringe marsh	I
143	Brock Cove	0.25	90	0.23					10	0.02					Fringe marsh	I

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SECTION III. LYNNHAVEN RIVER, EASTERN BRANCH

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
144	Brock Cove	1.0	90	0.9					assoc				10	k 0.1	Cove marsh	I
145	Brock Cove	0.5	90	0.45					10	0.05					Pocket marsh and fringe	I
146	Brock Cove	0.5	60	0.3	10	0.05	10	0.05	20	0.1					Fringe and spit marsh	I
147	Lynnhaven River	2.5	40	1.0	30	0.75	20	0.5	10	0.25					Spit marsh with scattered sea oxeye and water hemp	XII
148	Lynnhaven River	0.25	80	0.2	10	0.02			10	0.02					Cove marsh	I
149	Lynnhaven River	0.5	80	0.4	10	0.05			10	0.05					Cove marsh	I
150	Lynnhaven River	0.5	70	0.35	20	0.1	5	0.02	5	0.02					Broad fringe averages 10 feet wide with sea oxeye	I
151	Lynnhaven River	0.25	100	0.25											Pocket marsh with saltbush and meadow in higher parts	I
152	Lynnhaven River	2.0	90	1.8	assoc		10	0.2	assoc				assoc	d	Pocket marsh	I
153	Lynnhaven River	0.5	70	0.35	20	0.1			10	0.05					Fringe and point marsh	I
154	Lynnhaven River	0.25	70	0.18	30	0.08	assoc		assoc						Fringe and pocket marsh with sea oxeye also present	I
155	Lynnhaven River	2.4	60	1.44			30	0.72	10	0.24			assoc	d,q	Cove marsh	I
156	Lynnhaven River	0.25	80	0.2	10	0.02			10	0.02					Fringe marsh averages 10 feet wide, aster and sea oxeye present	I
157	Lynnhaven River	0.25	80	0.2	10	0.02	10	0.02							Fringe marsh with scattered aster and sea oxeye	I

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SECTION III. LYNNHAVEN RIVER, EASTERN BRANCH

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
158	Lynnhaven River	0.25	50	0.12	40	0.1			10	0.02					Fringe marsh averages 10 feet wide. Aster, sea oxeye	I
159	Lynnhaven River	0.5	50	0.25	20	0.1	10	0.05	10	0.05			10	Sea oxeye 0.05	Point marsh and fringe	I
160	Lynnhaven River	0.75	80	0.6					10	0.08			10	Sea oxeye 0.08	Point marsh and fringe	I
161	Lynnhaven River	0.25	40	0.1	10	0.02	30	0.08	20	0.05					Fringe marsh	XII
162	Lynnhaven River	3.0	60	1.8	20	0.6	10	0.3	10	0.3					Broad fringe and spit with old spoil in center	I
163	Lynnhaven River	0.25	100	0.25											Fringe marsh and spit with saltbush in higher areas	I
164	Lynnhaven River	0.5	100	0.5											Pocket marsh with saltbush along upland margin.	I
165	Lynnhaven River	0.75	90	0.68	10	0.08									Pocket and fringe with scattered saltbush and sea oxeye	I
166	Lynnhaven River	7.1	90	6.39	assoc				assoc				10	c,d 0.71	Extensive pocket marsh	I
167	Lynnhaven River	1.0	90	0.9	5	0.05	5	0.05							Pocket marsh with scattered saltbush and aster	I
168	Lynnhaven River	0.25	100	0.25											Marsh island	I
169	Lynnhaven River	0.5	60	0.3	10	0.05	30	0.15							Pocket and fringe with scattered saltbush	I
170	Lynnhaven River	0.25	70	0.18	30	0.08									Fringe and island with old spoil at east end	I
171	Lynnhaven River	0.5	80	0.4	20	0.1			assoc					q	Fringe and spit marsh with sea oxeye	I

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SECTION III. LYNNHAVEN RIVER, EASTERN BRANCH

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
172	Lynnhaven River	0.35	50	0.18	20	0.07	20	0.07	10	0.04					Fringe marsh averages 20 feet wide. Sea oxeye	I
173	Avery Island	0.37	50	0.19			30	0.11					20	Sea oxeye 0.07	25 foot(avr.) fringe with scattered water hemp and aster	I
174	Avery Island	2.0	60	1.2	20	0.4	10	0.2	10	0.2					Spit marsh with scattered saltmarsh aster and sea oxeye	I
175	Shorehaven	0.25	90	0.23			10	0.02							Cove marsh-5 ft. wide fringe spoil behind all marsh fringe	I
176	Shorehaven	0.75	80	0.6	20	0.15									40 to 50 ft. wide fringe with Sb and Md present also	I
177	Shorehaven	0.75	60	0.45	30	0.22	assoc		assoc				10	k 0.08	Pocket marsh and fringe	I
178	Shorehaven	0.75	90	0.68	10	0.08									Pocket marsh	I
179	Shorehaven	0.25	100	0.25											Fringe marsh with Sb line	I
180	Shorehaven	0.25	100	0.25											Point marsh with scattered Jr, Sb and sea oxeye	I
181	Shorehaven	0.25	100	0.25											Pocket marsh with dredged boat slip cut in	I
182	Shorehaven	0.5	100	0.5											Pocket marsh with scattered needlerush, saltbush and meadow	I
183	Shorehaven	8.2	70	5.74	10	0.82	10	0.82	assoc				10	k,c,d,f 0.82	Channelized creek marsh	I
184	Hog Pen Neck	0.5	90	0.45	10	0.05									Channelized cove marsh	I
185	Hog Pen Neck	1.0	70	0.7	30	0.3									Cove marsh	I

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#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
186	Hog Pen Neck	0.25	100	0.25											Cove marsh with scattered saltbush along upland border	I
187	Hog Pen Neck	9.0	80	7.2	10	0.9	10	0.9							Broad fringe with scattered reed grass and saltbush.	I
188	Trantwood Shores	0.25	90	0.23	assoc				10	0.02					Point and fringe marsh with scattered sea oxeye	I
189	Brown Cove	0.25	70	0.18	20	0.05	10	0.02							Fringe marsh with scattered saltbush in higher parts	I
190	Brown Cove	3.5	40	1.4	40	1.4	10	0.35	10	0.35					Broad fringe and pocket marsh	XII
191	Brown Cove	0.5	70	0.35			20	0.1	10	0.05					Fringe and pocket marsh with reedgrass and needlerush	I
192	Brown Cove	1.0	30	0.3	50	0.5	10	0.1	10	0.1					Sea oxeye present also	III
193	Brown Cove	0.25	60	0.15	20	0.05	20	0.05							Pocket marsh	I
194	Brown Cove	1.6	40	0.64	25	0.4	10	0.16	25	0.4					Pocket marsh with scattered aster, saltwort and sea oxeye	XII
195	Brown Cove	1.0	70	0.7	20	0.2	10	0.1							Cove marsh and broad fringe averaging 30 ft. wide	I
196	Eastern Branch, Lynnhaven River	1.6	70	1.12	20	0.32	10	0.16							Point marsh and fringe	I
197	Eastern Branch, Lynnhaven River	0.25	70	0.18	20	0.05	10	0.02							Pocket marsh with sea oxeye and saltbush also	I
198	Eastern Branch, Lynnhaven River	1.0	90	0.9	10	0.1									Cove marsh with saltbush, sea oxeye and meadow grasses	I
199	Eastern Branch, Lynnhaven River	0.5	70	0.35	20	0.1	10	0.05							Pocket and point marsh with scattered saltbush present	I

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SECTION III. LYNNHAVEN RIVER, EASTERN BRANCH

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
200	Eastern Branch Lynnhaven River	2.2	80	1.76	10	0.22	10	0.22							Cove marsh with saltbush in higher portions	I
201	Eastern Branch Lynnhaven River	4.4	80	3.52	10	0.44	10	0.44							Cove marsh with scattered saltbush, aster and reed grass	I
202	Eastern Branch Lynnhaven River	0.75	70	0.53	10	0.08	10	0.08	10	0.08					Broad fringe marsh	I
203	Eastern Branch Lynnhaven River	2.0	80	1.6			10	0.2	10	0.2					Cove marsh with scattered aster, reedgrass, Jr and Sc.	I
204	Eastern Branch Lynnhaven River	3.0	50	1.5	30	0.9	10	0.3	10	0.3					Channelized cove marsh with scattered reedgrass present	I
205	Eastern Branch Lynnhaven River	0.25	90	0.23					10	0.02					Broad fringe with some meadow grasses present also	I
206	Eastern Branch Lynnhaven River	0.25	40	0.1			40	0.1	20	0.05					Marsh island with upland plant species also present	XII
207	Eastern Branch Lynnhaven River	2.3	60	1.38	20	0.46	10	0.23	10	0.23					Channelized cove marsh with aster and water hemp also	I
208	Eastern Branch Lynnhaven River	0.25	60	0.15	30	0.08			10	0.02					Point and fringe marsh	I
209	Eastern Branch Lynnhaven River	0.5	50	0.25	40	0.2			10	0.05					Fringe marsh generally 30 feet wide	I
210	Eastern Branch Lynnhaven River	6.0	70	4.2	10	0.6	10	0.6	10	0.6	assoc				Channelized cove marsh with water hemp and aster	I
211	Eastern Branch Lynnhaven River	0.5	90	0.45			10	0.05							Pocket & fringe marsh with Jr, Sb, Aster and water hemp	I
212	Wolfsnare Creek	0.5	60	0.3			20	0.1	20	0.1					Big cordgrass and needlerush also present	I
213	Wolfsnare Creek	0.5	60	0.3	30	0.15			10	0.05					Fringe and pocket marsh	I

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SECTION III. LYNNHAVEN RIVER, EASTERN BRANCH

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
214	Wolfsnare Creek	1.8	40	0.72	10	0.18	20	0.36	30	0.54					Channelized pocket marsh with aster and reedgrass present	XII
215	Wolfsnare Creek	1.2	60	0.72	10	0.12	20	0.24	10	0.12					Marsh island with aster and big cordgrass present	I
216	Wolfsnare Creek	0.25	70	0.18			10	0.02	20	0.05					Aster and big cordgrass also	I
217	Wolfsnare Creek	2.2	30	0.66	20	0.44	40	0.88	10	0.22					Marsh island	XII
218	Wolfsnare Creek	2.0	20	0.4	10	0.2	50	1.0	20	0.4					Marsh aster & threesquare also on this marsh island	II
219A	Wolfsnare Creek	9.4	20	1.88	assoc		10	0.94	60	5.64	assoc		10	k,d,c, 0.94	Marsh grades into freshwater marsh & swamp (see 219B)	IV
219B	Wolfsnare Creek	7.4											100	i,j,e,d,m 7.4	Freshwater mixed marsh contains many other freshwater species	XI
220	Wolfsnare Creek	2.4	30	0.72			20	0.48	50	1.2					Disturbed area also contains reed grass and needlerush	IV
221	Wolfsnare Creek	13.5	20	2.7	assoc		20	2.7	50	6.75	assoc		10	d, 1.35	North side of creek disturbed by clearing operations	IV
222	Wolfsnare Creek	5.3	10	0.53	20	1.06	30	1.59	30	1.59	assoc		10	c,f 0.53	Broad fringe also contains bulrush, <i>Scirpus robustus</i>	XII
223	Wolfsnare Creek	3.7	20	0.74			60	2.22	20	0.74					Broad fringe with bulrush and needlerush also present	II
224	Wolfsnare Creek	9.0	30	2.7	20	1.8	20	1.8	30	2.7	assoc		also present	c,d,f,k	Channelized pocket marsh	XII
225	Wolfsnare Creek	0.25	70	0.18			10	0.02	10	0.02	assoc		10	k,c,f, 0.02	Pocket marsh	I
226	Wolfsnare Creek	0.25	50	0.12			40	0.1	10	0.02	assoc				Much of marsh replanted after being illegally spoiled	I

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#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
227	Wolfsnare Creek	1.5	70	1.05			30	0.45	assoc					c	Some growth of reed grass and upland species on spoil	I
228	Wolfsnare Point	0.5	60	0.3	30	0.15			10	0.05	assoc			k,c	Fringe and small pocket marshes	I
229	London Bridge Creek	3.0	60	1.8			40	1.2			assoc				Marsh island	I
230	London Bridge Creek	21.6	30	6.48	30	6.48	30	6.48	assoc		assoc		10	d,f,k 2.16	Broad fringe and pocket with saltmarsh bulrush also present	XII
231	London Bridge Creek	5.5	20	1.1	10	0.55	60	3.3	5	0.28	5	0.28			Broad fringe marsh	II
232	London Bridge Creek	1.2	30	0.36			40	0.48	20	0.24	10	0.12		c,k	Pocket marsh	XII
233	London Bridge Creek	2.0	60	1.2			20	0.4	10	0.2	10	0.2		k	Fringe marsh	I
234	London Bridge Creek	18.2	10	1.82			30	5.46	40	7.28	20	3.64		d,l	Creek marsh also contains saltmarsh bulrush (<i>Scirpus robustus</i>)	XII
235	London Bridge Creek	8.8	10	0.88			40	3.52	40	3.52	10	0.88			Marsh also contains olney three square and saltmarsh bulrush	XII
236	London Bridge Creek	0.75	30	0.23			20	0.15	30	0.23	20	0.15		k	Fringe marsh	XII
237	London Bridge Creek	3.7	60	2.22			20	0.74	10	0.37	10	0.37		k	Fringe marsh	I
238	London Bridge Creek	1.8	30	0.54			60	1.08	10	0.18	assoc			k		II
239	London Bridge Creek	0.25	40	0.1					40	0.1	10	0.02	10	k 0.02	Fringe marsh on island and in-board of south end	XII
240	London Bridge Creek	2.3	30	0.69			50	1.15	20	0.46					Island with spoil in center portion	II

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SECTION III. LYNNHAVEN RIVER, EASTERN BRANCH

#	PLACE NAME	ACRES	Sa % ACRES		Jr % ACRES		Md % ACRES		Sb % ACRES		Sc % ACRES		OTHER % ACRES		OBSERVATIONS	MARSH TYPE
241	Pinetree Branch	2.6							30	0.78	70	1.82			Marsh also contains arrow arum, saltmarsh bulrush, jewelweed, waterdock and ferns	V
242	Pinetree Branch	3.6	20	0.72			60	2.16	20	0.72					Also contains threesquare and big cordgrass	II
243	Pinetree Branch	1.5	30	0.45			70	1.05							Marsh island with scattered saltmarsh bulrush and Sb	II
244	Pinetree Branch	0.25	90	0.23			10	0.02							Marsh island	I
245	Pinetree Branch	4.0	40	1.6	20	0.8	40	1.6	assoc					c,d	Saltmarsh bulrush also present	XII
246	Pinetree Branch	4.8	40	1.92	20	0.96	40	1.92	assoc					d	Large pocket marsh	XII
247	Pinetree Branch	0.75	50	0.38	20	0.15	30	0.23	assoc		assoc				Broad fringe also contains saltmarsh bulrush	I
248	Pinetree Branch	2.9	50	1.45	10	0.29	40	1.16	assoc		assoc				Pocket marsh	I
249	Eastern Branch Lynnhaven River	0.25	80	0.2	10	0.02	assoc		10	0.02	assoc			k	Broad fringe	I
250	Eastern Branch Lynnhaven River	0.5	80	0.4			5	0.02	10	0.05			5	f 0.02	Saltmarsh bulrush also present	I
251	Eastern Branch Lynnhaven River	0.25	30	0.08			50	0.13	20	0.05	assoc				Saltmarsh bulrush also present	II
252	Smith Point	0.25	60	0.15	40	0.1			assoc						Point marsh and fringe	I
253	Smith Point	0.5	70	0.35	10	0.05	20	0.1	assoc						Pocket marsh	I
254	Smith Point	0.25	80	0.2	10	0.02	10	0.02	assoc						Broad fringe marsh	I

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			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
255	Smith Point	2.6	90	2.34			10	0.26	assoc		assoc			d	Left branch of pocket has been dredged	I
256	Smith Point	4.9	30	1.47	40	1.96	30	1.47	assoc					k	Broad fringe marsh	XII
257	Smith Point	5.8	60	3.48	10	0.58	30	1.74						k	Saltmarsh bulrush also present	I
258	Smith Point	0.25	20	0.05			50	0.13	30	0.08					Marsh peninsula	II
259	Little Haven	0.5	80	0.4					20	0.1				d,f,k	Marsh fringe averages 5 feet wide	I
260	Little Haven	14.0	50	7.0	10	1.4	40	5.6	assoc		assoc			d,f,k,c	Extensive marsh	I
261	Little Haven	4.4	60	2.64	30	1.32	10	0.44	assoc					d,f	Pocket marsh	I
262	Little Haven	1.7	60	1.02	30	0.51	10	0.17	assoc					f	Broad fringe marsh	I
263	Little Haven	0.5	90	0.45			10	0.05							Marsh fringe averages 20 feet wide	I
264	Little Haven	0.5	60	0.3	assoc		40	0.2						f	Point marsh and fringe Point has old spoil on it	I
265	Little Haven	0.25	80	0.2	10	0.02	10	0.02	assoc					f	Fringe marsh	I
266	Little Haven	0.5	80	0.4	10	0.05	10	0.05							Broad fringe marsh	I
267	Eastern Branch Lynnhaven River	1.9	90	1.71			10	0.19							Pocket marsh	I
268	Eastern Branch Lynnhaven River	0.5	100	0.5			assoc		assoc						Marsh island	I

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SECTION III. LYNNHAVEN RIVER, EASTERN BRANCH

#	PLACE NAME	ACRES	Sa % ACRES		Jr % ACRES		Md % ACRES		Sb % ACRES		Sc % ACRES		OTHER % ACRES		OBSERVATIONS	MARSH TYPE
269	Eastern Branch Lynnhaven River	0.25	90	0.23					10	0.02					Fringe marsh and island	I
270	Eastern Branch Lynnhaven River	0.5	60	0.3	20	0.1			10	0.05			10	^c 0.05	Pocket and point marsh	I
271	Eastern Branch Lynnhaven River	0.25	90	0.23	10	0.02									Pocket marsh	I
272	Eastern Branch Lynnhaven River	0.5	40	0.2	40	0.2	10	0.05	10	0.05					Fringe and point marsh	XII
273	Eastern Branch Lynnhaven River	1.5	70	1.05	assoc		20	0.3	10	0.15				d	Cove marsh	I
274	Eastern Branch Lynnhaven River	0.25	90	0.23					10	0.02						I
275	Eastern Branch Lynnhaven River	0.25	90	0.23	assoc				10	0.02				k	Fringe marsh	I
276	Eastern Branch Lynnhaven River	0.5	100	0.5	assoc				assoc						Pocket and fringe marsh	I
277	Eastern Branch Lynnhaven River	0.5	70	0.35	20	0.1			10	0.05					Point and fringe marsh	I
278	Eastern Branch Lynnhaven River	0.25	90	0.23	10	0.02									Fringe marsh	I
279	Eastern Branch Lynnhaven River	4.4	70	3.08	20	0.88	10	0.44	assoc					d	Cove marsh	I
280	Eastern Branch Lynnhaven River	13.2	80	10.56	20	2.64	assoc		assoc						Cove marsh	I
281	Eastern Branch Lynnhaven River	0.25	70	0.18	30	0.08			assoc						Point and fringe marsh	I
282	Eastern Branch Lynnhaven River	2.8	70	1.96	20	0.56	assoc		10	0.28					Pocket marsh	I

Sa = Saltmarsh Cordgrass
Jr = Black Needlerush
Md = Saltgrass Meadow
Sb = Saltbushes
Sc = Big Cordgrass

a = Saltmarsh Bulrush
b = Saltmarsh Fleabane
c = Saltmarsh Aster
d = Cattail
e = Marsh Hibiscus

f = Water Hemp
g = Switch Grass
h = Foxtail Grass
i = Arrow Arum
j = Pickerel Weed

k = Reed Grass
l = Olney Threesquare
m = Marsh Mallow
n = Saltmarsh Loosestrife
o = Smartweed

p = Wild Rice
q = Sea Lavender
r = Marsh Pink
s = Saltwort
t = Yellow Pond-lily

SECTION III. LYNNHAVEN RIVER, EASTERN BRANCH

#	PLACE NAME	ACRES	%	Sa ACRES	%	Jr ACRES	%	Md ACRES	%	Sb ACRES	%	Sc ACRES	%	OTHER ACRES	OBSERVATIONS	MARSH TYPE
283	Eastern Branch Lynnhaven River	0.25	40	0.1	40	0.1	10	0.02	10	0.02				c	Fringe marsh averages 20 feet wide	XII
284	Eastern Branch Lynnhaven River	4.8	80	3.84	10	0.48	10	0.48	assoc					c	Cove marsh	I
285	Eastern Branch Lynnhaven River	0.25	90	0.23	10	0.02			assoc						Pocket marsh	I
286	Eastern Branch Lynnhaven River	6.6	60	3.96	20	1.32	20	1.32	assoc						Cove marsh	I
287	Sandy Point	0.25	80	0.2	10	0.02	assoc		10	0.02					Pocket marsh	I
288	Sandy Point	1.4	80	1.12	10	0.14	assoc		10	0.14					Pocket marsh	I
289	Sandy Point	0.25	80	0.2			20	0.05							Pocket marsh	I
290	Sandy Point	0.25	40	0.1	50	0.12			10	0.02					Point marsh	III
291	Sandy Point	0.5	80	0.4	10	0.05			10	0.05					Point also contains cedar and live oak trees	I
292	Sandy Point	0.25	90	0.23	10	0.02	assoc		assoc						Pocket marsh	I
293	Sandy Point	0.25	30	0.08	10	0.02	30	0.08	30	0.08				c	Point and fringe marsh with sea oxeye also present	XII
294	Sandy Point	0.25	90	0.23					10	0.02					Pocket marsh	I
295	Sandy Point	1.0	40	0.4	10	0.1	30	0.3	20	0.2				sea oxeye, k	Point marsh and islands	XII
296	Sandy Point	0.5	70	0.35	10	0.05	20	0.1	assoc					c,g,s	Pocket marsh	I

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n = Saltmarsh Loosestrife
o = Smartweed

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q = Sea Lavender
r = Marsh Pink
s = Saltwort
t = Yellow Pond-lily

SECTION III. LYNNHAVEN RIVER, EASTERN BRANCH

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
297	Sandy Point	0.25	60	0.15	20	0.05	10	0.02	10	0.02				Sc	Point marsh and fringe	I
298	Poorhouse Cove	1.5	60	0.9	30	0.45	assoc		10	0.15				Sea oxeye	Point marsh	I
299	Poorhouse Cove	1.8	50	0.9	30	0.54	assoc		20	0.36				d,k	Cove marsh	I
300	Poorhouse Cove	1.9	70	1.33	10	0.19	10	0.19	10	0.19					Point marsh	I
301	Mapps Point	2.6	60	1.56	10	0.26	30	0.78	assoc						Point marsh	I
302	Eagles Nest Point	1.0	70	0.7	20	0.2	10	0.1	assoc						Fringe marsh	I
303	Dix Creek	0.25	100	0.25											Pocket marsh	I
304	Dix Creek	0.25	60	0.15	assoc		30	0.08	10	0.02					Fringe marsh	I
305	Dix Creek	0.25	80	0.2	assoc		20	0.05	assoc					Sea oxeye	Cove marsh	I
306	Dix Creek	2.5	50	1.25			30	0.75	10	0.25			10	Sea oxeye 0.25	Spit marsh also contains aster, sea lavender and reed grass	I
307	Keeling Cove	3.1	50	1.55	30	0.93	10	0.31	10	0.31					Point marsh and fringe	I
308	Keeling Cove	0.25	90	0.23	10	0.02									Pocket and fringe	I
309	Keeling Cove	0.25	90	0.23			assoc		10	0.02					Fringe marsh	I
310	Humes Island Marshes	38.9	90	35.01	assoc		10	3.89						c,g	Extensive marsh islands also contain sea oxeye	I

Sa = Saltmarsh Cordgrass
 Jr = Black Needlerush
 Md = Saltgrass Meadow
 Sb = Saltbushes
 Sc = Big Cordgrass

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 b = Saltmarsh Fleabane
 c = Saltmarsh Aster
 d = Cattail
 e = Marsh Hibiscus

f = Water Hemp
 g = Switch Grass
 h = Foxtail Grass
 i = Arrow Arum
 j = Pickerel Weed

k = Reed Grass
 l = Olney Threesquare
 m = Marsh Mallow
 n = Saltmarsh Loosestrife
 o = Smartweed

p = Wild Rice
 q = Sea Lavender
 r = Marsh Pink
 s = Saltwort
 t = Yellow Pond-lily

SECTION III. LYNNHAVEN RIVER, EASTERN BRANCH

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
	Total Section III	409.92	56	229.54	10	40.85	18	74.46	10	42.07	2	7.48	4	15.5		

Sa = Saltmarsh Cordgrass
 Jr = Black Needlerush
 Md = Saltgrass Meadow
 Sb = Saltbushes
 Sc = Big Cordgrass

a = Saltmarsh Bulrush
 b = Saltmarsh Fleabane
 c = Saltmarsh Aster
 d = Cattail
 e = Marsh Hibiscus

f = Water Hemp
 g = Switch Grass
 h = Foxtail Grass
 i = Arrow Arum
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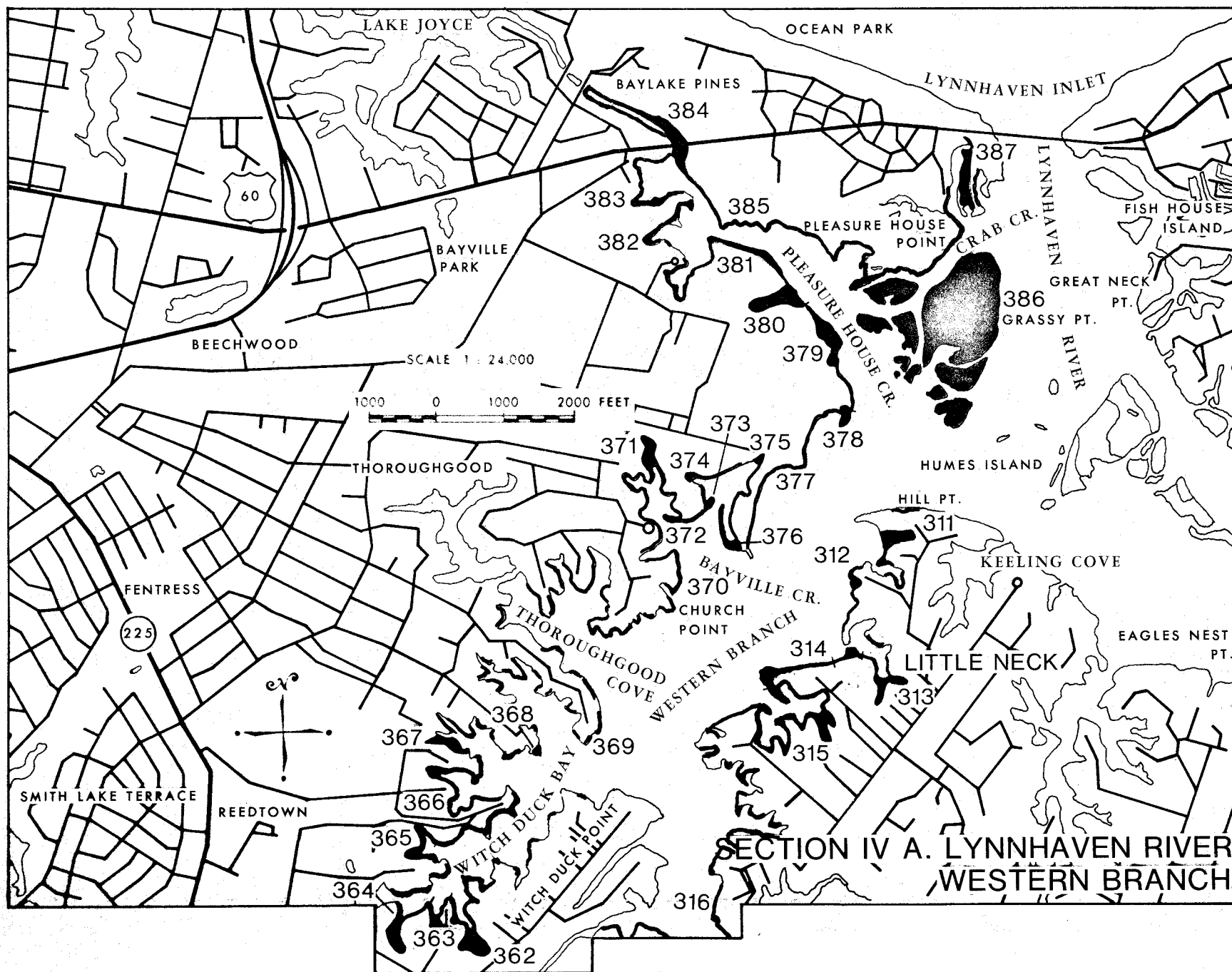
k = Reed Grass
 l = Olney Threesquare
 m = Marsh Mallow
 n = Saltmarsh Loosestrife
 o = Smartweed

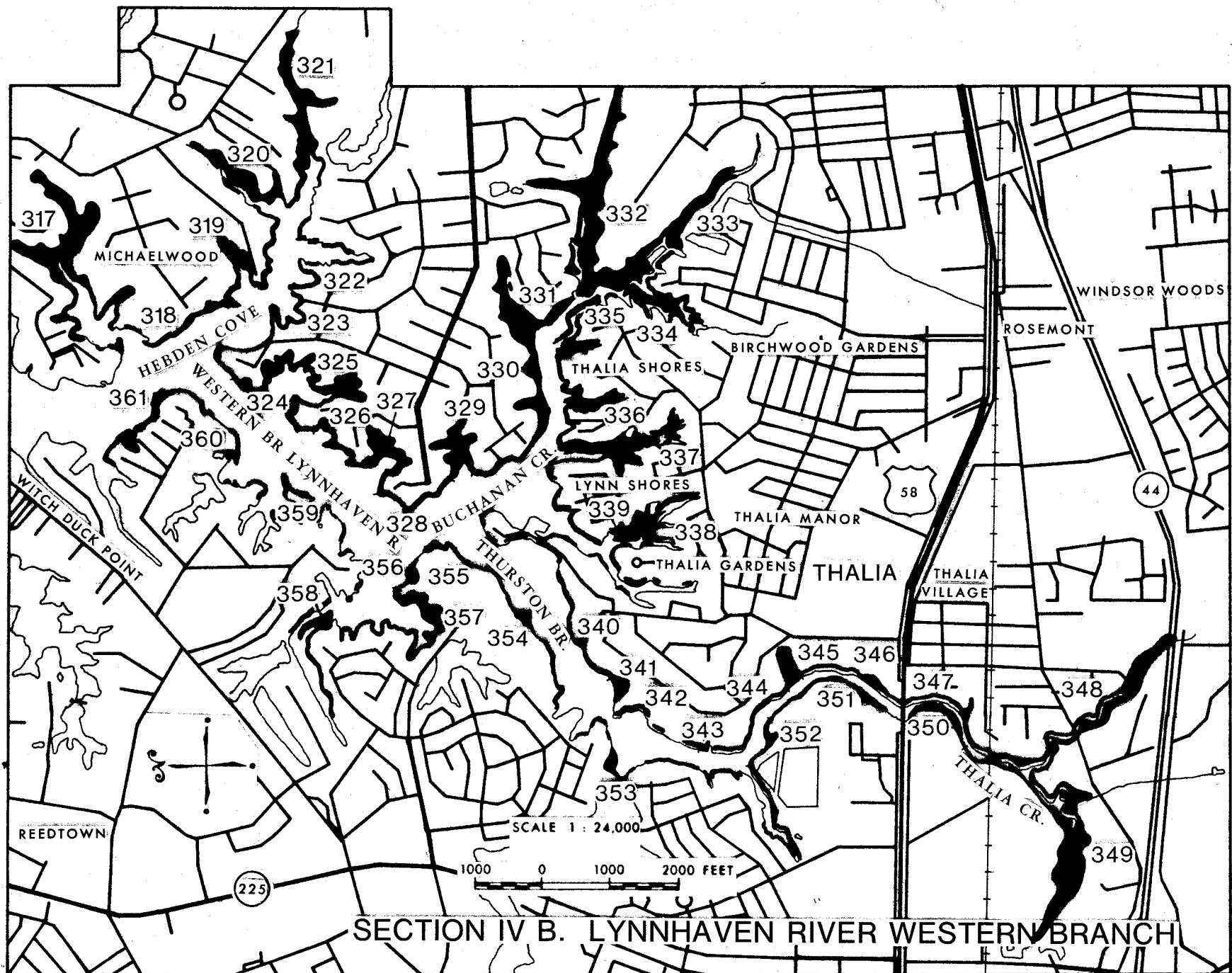
p = Wild Rice
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Section IV

Lynnhaven River, Western Branch

As in Section III, the marshes of this section are mostly small but numerous fringes and pockets, with creek marshes at the heads of tributaries. Saltmarsh cordgrass is more dominant than in Section III, comprising 69% of the total. The density of residential shoreline development and therefore recreational boating is relatively high here, as it is in most parts of the city. The marshes are under constant stress due to human activities which generate non-point source pollution, boat wakes, turbidity, etc. At the same time, however, the marshes are helping to alleviate these stresses in the river and thus function in the maintenance of the aquatic system's delicate ecological equilibrium.





SECTION IV B. LYNNAHAVEN RIVER WESTERN BRANCH

SECTION IV. LYNNHAVEN RIVER, WESTERN BRANCH

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
311	Hill Point	2.4	50	1.2	30	0.72	20	0.48	assoc					k	Pocket marsh	I
312	Lynnhaven River Western Branch	0.25	100	0.25											Spit marsh and fringe	I
313	Lynnhaven River Western Branch	3.1	100	3.1											Pocket marsh	I
314	Lynnhaven River Western Branch	3.2	60	1.92	30	0.96	10	0.32							Fringe marsh	I
315	Lynnhaven River Western Branch	7.0	80	5.6	10	0.7	assoc		10	0.7				c,s	Cove and spit marshes	I
316	Lynnhaven River Western Branch	0.25	90	0.23	10	0.02			assoc						Cove marsh and fringe	I
317	Lynnhaven River Western Branch	18.0	100	18.0	assoc		assoc		assoc						Cove marsh	I
318	Hebden Cove	0.25	60	0.15	20	0.05	10	0.02	10	0.02					Spit marsh and fringe	I
319	Hebden Cove	2.7	60	1.62	10	0.27							30	k 0.81	Pocket marsh	I
320	Hebden Cove	5.5	90	4.95	assoc		10	0.55						f,k	Creek marsh	I
321	Hebden Cove	9.3	80	7.44	assoc		20	1.86						c,d,k	Creek marsh	I
322	Hebden Cove	2.5	80	2.0	20	0.5									Cove marsh	I
323	Hebden Cove	1.7	70	1.19	30	0.51									Cove marsh	I
324	Lynnhaven River Western Branch	0.25	80	0.2	20	0.05									Pocket marsh	I

Sa = Saltmarsh Cordgrass
Jr = Black Needlerush
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m = Marsh Mallow
n = Saltmarsh Loosestrife
o = Smartweed

p = Wild Rice
q = Sea Lavender
r = Marsh Pink
s = Saltwort
t = Yellow Pond-lily

SECTION IV. LYNNHAVEN RIVER, WESTERN BRANCH

#	PLACE NAME	ACRES	Sa % ACRES		Jr % ACRES		Md % ACRES		Sb % ACRES		Sc % ACRES		OTHER % ACRES		OBSERVATIONS	MARSH TYPE
325	Lynnhaven River Western Branch	8.0	90	7.2	10	0.8									Cove marsh with pocket	I
326	Lynnhaven River Western Branch	1.0	80	0.8	20	0.2	assoc							c	Cove marsh	I
327	Lynnhaven River Western Branch	3.8	90	3.42	10	0.38								c	Cove marsh	I
328	Lynnhaven River Western Branch	0.5	60	0.3	40	0.2			assoc						Marsh fringe averages 10 feet wide	I
329	Buchanan Creek	3.3	70	2.31	20	0.66	10	0.33							Pocket marsh	I
330	Buchanan Creek	12.2	70	8.54	10	1.22	20	2.44	assoc					c,d,f,k	Creek marsh	I
331	Buchanan Creek	0.25	90	0.23			10	0.02							Marsh island	I
332	Buchanan Creek	20.4	50	10.2			20	4.08	30	6.12	assoc			f,k	Old spoil at upper end. Salt- marsh bulrush also present	I
333	Buchanan Creek	5.4	10	0.54			20	1.08	30	1.62	10	0.54	30	k 1.62	Highly disturbed area. Upland species on old spoil	XII
334	Buchanan Creek	2.8	30	0.84	assoc		60	1.68	10	0.28	assoc			c	Marsh peninsula Saltmarsh bulrush also present	II
335	Buchanan Creek	2.0	80	1.6			20	0.4						f	Marsh island	I
336	Buchanan Creek	1.1	100	1.1											Marsh island	I
337	Buchanan Creek	1.5	100	1.5											Marsh island	I
338	Buchanan Creek	0.5	70	0.35			10	0.05	20	0.1				k	Point marsh	I

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SECTION IV. LYNNHAVEN RIVER, WESTERN BRANCH

#	PLACE NAME	ACRES	Sa % ACRES		Jr % ACRES		Md % ACRES		Sb % ACRES		Sc % ACRES		OTHER % ACRES		OBSERVATIONS	MARSH TYPE
339	Buchanan Creek	1.3	70	0.91			10	0.13	20	0.26				k	Marsh Island	I
340	Thurston Branch	0.5	70	0.35	assoc		10	0.05	10	0.05	assoc		10	d 0.05	Fringe marsh	I
341	Thurston Branch	0.25	70	0.18	10	0.02					assoc		20	k 0.05	Pocket marsh	I
342	Thurston Branch	0.25	60	0.15	10	0.02	10	0.02	10	0.02	10	0.02			Fringe marsh	I
343	Thalia Creek	0.25	60	0.15			30	0.08	10	0.02				d	Fringe marsh	I
344	Thalia Creek	0.25	60	0.15	asoc		30	0.08	10	0.02	assoc				Fringe marsh	I
345	Thalia Creek	1.4	30	0.42	assoc		40	0.56	20	0.28	10	0.14			Pocket marsh, channelized spoil on sides	XII
346	Thalia Creek	1.0	30	0.3	assoc		40	0.4	20	0.2	10	0.1		k	Fringe marsh	XII
347	Thalia Creek	3.8	20	0.76			20	0.76	20	0.76	40	1.52			Pocket & fringe	XII
348	Thalia Creek	6.7					20	1.34	30	2.01	50	3.35			Creek marsh	V
349	Thalia Creek	12.2	20	2.44			20	2.44	30	3.66	30	3.66			Creek marsh	XII
350	Thalia Creek	1.8	20	0.36			10	0.18	60	1.08	10	0.18			Broad fringe	IV
351	Thalia Creek	1.9	30	0.57			50	0.95	10	0.19	assoc		10	k,c 0.19	Fringe marsh	II
352	Thalia Creek	0.5	50	0.25	assoc		20	0.1	30	0.15	assoc				Fringe and pocket marsh	I

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SECTION IV. LYNNHAVEN RIVER, WESTERN BRANCH

#	PLACE NAME	ACRES	Sa %		Jr %		Md %		Sb %		Sc %		OTHER %		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
353	Thurston Branch	0.25	60	0.15	10	0.02							30	k 0.08		I
354	Thurston Branch	2.4	60	1.44	10	0.24	10	0.24					20	d 0.48	Broad fringe also contains big cordgrass and reedgrass	I
355	Thurston Branch	0.5	80	0.4	10	0.05	assoc		10	0.05					Broad fringe	I
356	Lynnhaven River Western Branch	1.3	80	1.04	10	0.13	assoc		10	0.13					Pocket marsh and fringe	I
357	Lynnhaven River Western Branch	3.3	90	2.97					10	0.33					Cove marsh	I
358	Lynnhaven River Western Branch	0.25	100	0.25			assoc		assoc						Marsh island	I
359	Lynnhaven River Western Branch	0.25	60	0.15	assoc		30	0.08	10	0.02					Fringe marsh	I
360	Lynnhaven River Western Branch	0.25	100	0.25											Point marsh	I
361	Lynnhaven River Western Branch	0.25	30	0.08	30	0.08	10	0.02	30	0.08					Point marsh	XII
362	Witch Duck Bay	3.3	90	2.97	assoc		10	0.33	assoc					d,f	Cove marsh	I
363	Witch Duck Bay	0.25	80	0.2			10	0.02					10	d 0.02	Pocket marsh with scattered needlerush and saltbush	I
364	Witch Duck Bay	2.2	80	1.76	assoc		20	0.44	assoc					d	Pocket marsh	I
365	Witch Duck Bay	1.0	80	0.8	20	0.2	assoc							d,k	Cove marsh	I
366	Witch Duck Bay	2.0	70	1.4	10	0.2	10	0.2	10	0.2				Sea oxeye	Cove marsh	I

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q = Sea Lavender
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SECTION IV. LYNNHAVEN RIVER, WESTERN BRANCH

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
367	Witch Duck Bay	0.5	100	0.5					assoc						Pocket marsh and fringe	I
368	Witch Duck Bay	0.25	50	0.12			30	0.08	20	0.05					Point marsh	I
369	Lynnhaven River Western Branch	0.25	40	0.1			40	0.1	20	0.05					Fringe marsh	XII
370	Bayville Creek	0.25	50	0.12	10	0.02	40	0.1	assoc					Sea oxeye	Point marsh and fringe	I
371	Bayville Creek	1.7	100	1.7											Pocket marsh	I
372	Bayville Creek	0.25	60	0.15	30	0.08	10	0.02	assoc					Sea oxeye	Spit marsh	I
373	Bayville Creek	1.5	90	1.35	10	0.15										I
374	Bayville Creek	0.25	100	0.25					assoc						Pocket marsh	I
375	Bayville Creek	0.25	100	0.25												I
376	Bayville Creek	2.4	80	1.92	20	0.48	assoc		assoc		assoc				Point marsh and fringe	I
377	Lynnhaven River Western Branch	1.0	60	0.6	20	0.2	10	0.1	10	0.1				^c Sea oxeye	Fringe marsh. Averages 15 feet wide	I
378	Lynnhaven River Western Branch	0.8	70	0.56	30	0.24			assoc						Point marsh	I
379	Pleasure House Creek	4.6	40	1.84	40	1.84	20	0.92	assoc					d	Fringe marsh	XII
380	Pleasure House Creek	3.5	60	2.1	20	0.7	10	0.35	10	0.35				d,k	Pocket marsh also contains saltmarsh bulrush	I

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p = Wild Rice
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SECTION IV. LYNNHAVEN RIVER, WESTERN BRANCH

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
381	Pleasure House Creek	5.4	30	1.62	60	3.24			10	0.54					Broad fringe marsh	III
382	Pleasure House Creek	1.6	80	1.28	assoc		20	0.32	assoc				d		Cove marsh (fringing) averages 15 feet wide	I
383	Pleasure House Creek	0.75	90	0.68			10	0.08							Cove marsh (fringing) averages 12 feet wide	I
384	Pleasure House Creek	2.0	10	0.2			40	0.8	50	1.0					Fringe marsh	IV
385	Pleasure House Point	11.4	90	10.26			10	1.14							Broad fringe averages 40 feet wide, Sb.	I
386	Grassy Point Islands	51.6	90	46.44	assoc		10	5.16					q,c sea oxeye		Marsh islands	I
387	Crab Creek	4.6	70	3.22			20	0.92	assoc				10	q,c,s 0.46	Marsh in lower areas of old spoil deposits	I
	Total Section IV	263.6	69	182.89	6	15.15	12	31.82	8	20.44	4	9.51	1	3.76		

Sa = Saltmarsh Cordgrass
 Jr = Black Needlerush
 Md = Saltgrass Meadow
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 Sc = Big Cordgrass

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 o = Smartweed

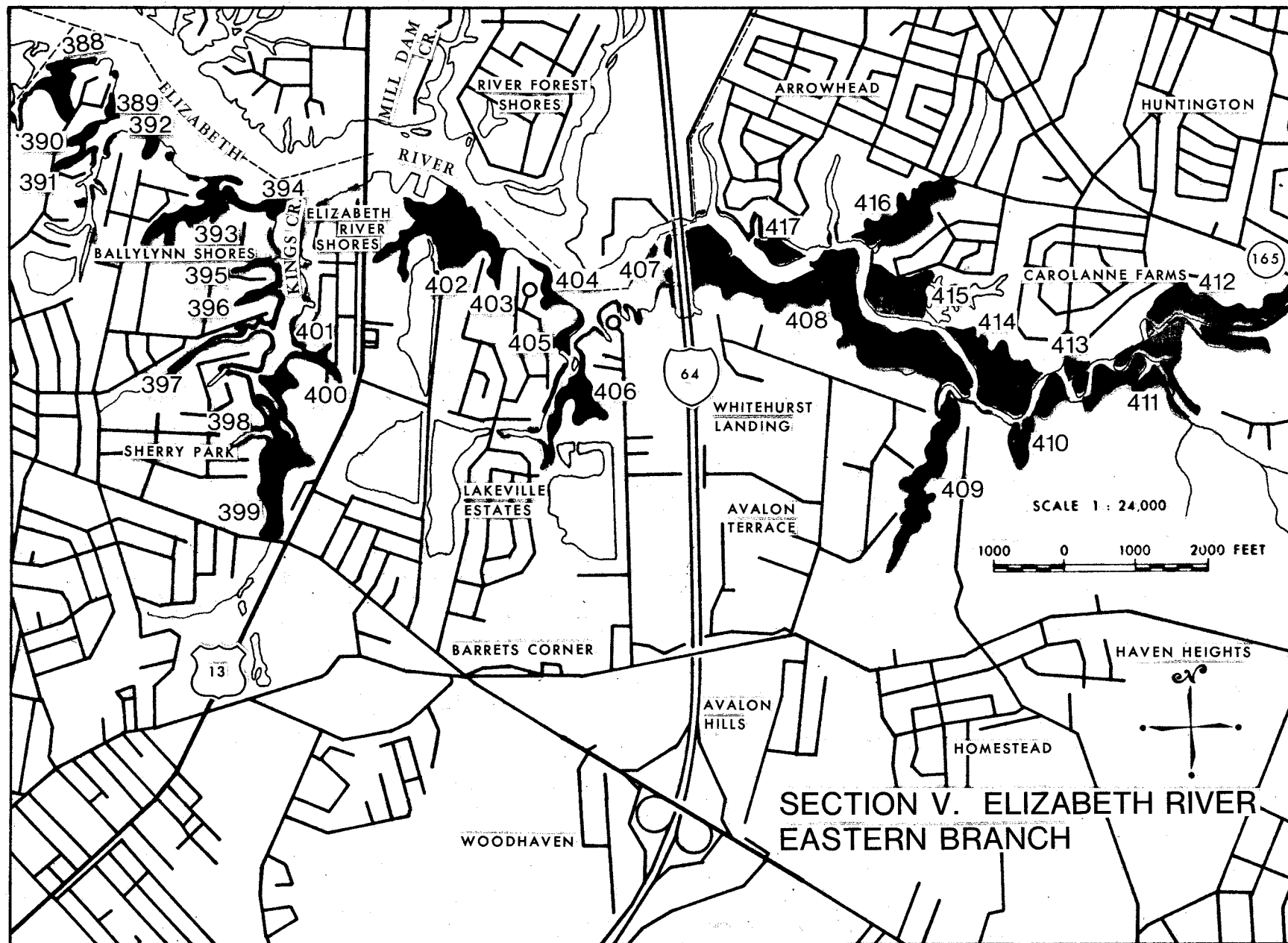
p = Wild Rice
 q = Sea Lavender
 r = Marsh Pink
 s = Saltwort
 t = Yellow Pond-lily

Section V

Elizabeth River, Eastern Branch

In contrast to Section III and IV, the wetlands of this section are mostly moderately large pocket and creek marshes, including the largest marsh of this inventory (No. 408, 52.5 acres). Although the downstream reaches are fairly well developed, the upstream shoreline is less populated, and large, little-disturbed marshes are found. Although most of the marshes are Type I (Saltmarsh Cordgrass), the dominant plant is saltbush, which in many areas forms virtually impenetrable thickets.

These marshes, due to their location, will undoubtedly become more important to the aquatic system as development in this area increases and non-point source pollution places additional stress on the river.



SECTION V. ELIZABETH RIVER, EASTERN BRANCH

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
388	E. B. Elizabeth River	3.1	90	2.79	assoc				10	0.31				k	Pocket marsh	I
389	E. B. Elizabeth River	0.25	80	0.2					10	0.02	10	0.02			Pocket marsh	I
390	E. B. Elizabeth River	0.25	80	0.2	assoc				10	0.02	10	0.02		k	Pocket marsh	I
391	E. B. Elizabeth River	0.5	90	0.45					10	0.05	assoc				Pocket marsh	I
392	E. B. Elizabeth River	0.5	60	0.3	10	0.05	10	0.05	20	0.1					Pocket marsh	I
393	E. B. Elizabeth River	7.0	80	5.6	assoc				10	0.7	10	0.7			New muskrat den in marsh	I
394	E. B. Elizabeth River	0.5	70	0.35	10	0.05			20	0.1	assoc			d	Marsh fringe averages 15 feet wide	I
395	Kings Creek	1.0	70	0.7			20	0.2	10	0.1					Pocket marsh	I
396	Kings Creek	1.0	70	0.7	assoc		10	0.1	20	0.2				c	Pocket marsh	I
397	Kings Creek	1.5	70	1.05	assoc		10	0.15	20	0.3					Pocket marsh	I
398	Kings Creek	2.2	60	1.32			10	0.22	20	0.44			10	f 0.22	Marsh island also contains Sc, c, k, and o	I
399	Kings Creek	13.1	70	9.17	assoc		10	1.31	10	1.31	10	1.31		c,f,k	Extensive creek marsh	I
400	Kings Creek	0.5	10	0.05			50	0.25	40	0.2	assoc			c,k	Pocket marsh	II
401	Kings Creek	0.25	90	0.23					10	0.02	assoc				Fringe marsh	I

Sa = Saltmarsh Cordgrass
 Jr = Black Needlerush
 Md = Saltgrass Meadow
 Sb = Saltbushes
 Sc = Big Cordgrass

a = Saltmarsh Bulrush
 b = Saltmarsh Fleabane
 c = Saltmarsh Aster
 d = Cattail
 e = Marsh Hibiscus

f = Water Hemp
 g = Switch Grass
 h = Foxtail Grass
 i = Arrow Arum
 j = Pickerel Weed

k = Reed Grass
 l = Olney Threesquare
 m = Marsh Mallow
 n = Saltmarsh Loosestrife
 o = Smartweed

p = Wild Rice
 q = Sea Lavender
 r = Marsh Pink
 s = Saltwort
 t = Yellow Pond-lily

SECTION V. ELIZABETH RIVER, EASTERN BRANCH

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
402	E. B. Elizabeth River	13.8	20	2.76			40	5.52	40	5.52					Extensive high marsh	XII
403	E. B. Elizabeth River	1.0	25	0.25			45	0.45	20	0.2	10	0.1		c	Fringe marsh	XII
404	E. B. Elizabeth River	0.5	60	0.3	assoc		10	0.05	30	0.15	assoc				Pocket and fringe	I
405	E. B. Elizabeth River	0.5	60	0.3	assoc		20	0.1	20	0.1	assoc			c		I
406	E. B. Elizabeth River	6.2	30	1.86			10	0.62	40	2.48	20	1.24		k	Old spoil on portions of marsh and islands	XII
407	E. B. Elizabeth River	1.0	70	0.7					30	0.3					3 marsh islands	I
408	E. B. Elizabeth River	52.5	30	15.75					50	26.25	10	5.25	10	k 5.25	Large high marsh. Portions disturbed by upland runoff	IV
409	E. B. Elizabeth River	11.1	assoc						30	3.33	70	7.77		c,o	Large creek marsh	V
410	E. B. Elizabeth River	5.8	10	0.58			assoc		50	2.9	40	2.32				IV
411	E. B. Elizabeth River	11.9	10	1.19			10	1.19	40	4.76	40	4.76			Creek marsh has been channelized and some marsh filled	XII
412	E. B. Elizabeth River	16.7	assoc				10	1.67	40	6.68	50	8.35				V
413	E. B. Elizabeth River	0.5	10	0.05					30	0.15	60	0.3				V
414	E. B. Elizabeth River	13.7	10	1.37					30	4.11	60	8.22				V
415	E. B. Elizabeth River	9.1	30	2.73					40	3.64	30	2.73		k,o		XII

Sa = Saltmarsh Cordgrass

Jr = Black Needlerush

Md = Saltgrass Meadow

Sb = Saltbushes

Sc = Big Cordgrass

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n = Saltmarsh Loosestrife

o = Smartweed

p = Wild Rice

q = Sea Lavender

r = Marsh Pink

s = Saltwort

t = Yellow Pond-lily

SECTION V. ELIZABETH RIVER, EASTERN BRANCH

#	PLACE NAME	ACRES	Sa % ACRES		Jr % ACRES		Md % ACRES		Sb % ACRES		Sc % ACRES		OTHER % ACRES		OBSERVATIONS	MARSH TYPE
416	E. B. Elizabeth River	9.8	20	1.96					50	4.9	30	2.94				IV
417	E. B. Elizabeth River	3.1	20	0.62					70	2.17	10	0.31		c	Marsh island	IV
	Total Section V	188.85	28	53.53		0.1	6	11.88	38	71.51	25	46.34	3	5.47		

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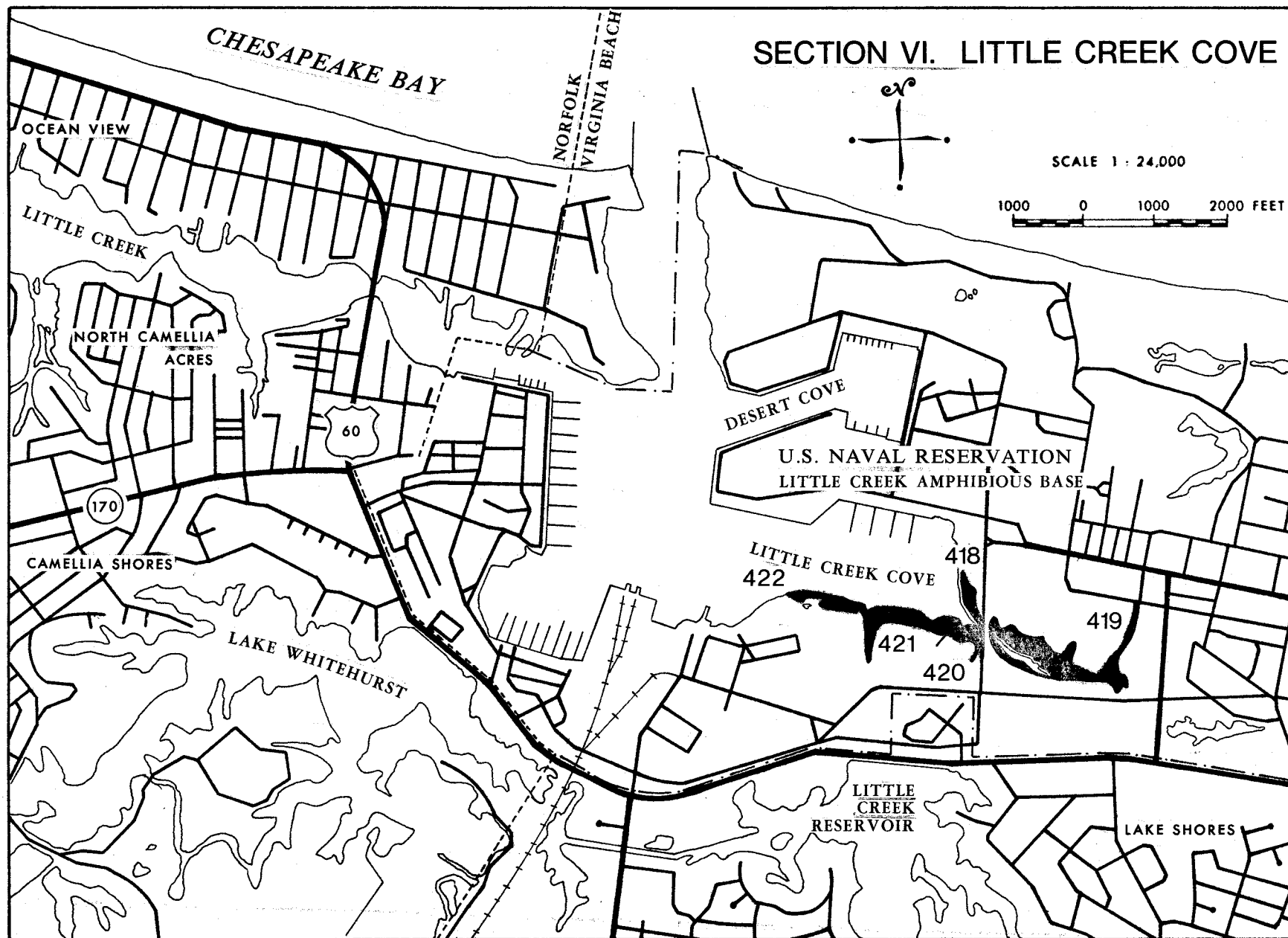
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Section VI

Little Creek Cove

Little Creek Cove has been extensively bulkheaded for ship mooring by the Little Creek Amphibious Base and thus contains only five marshes. These five marshes, mostly dominated by saltmarsh cordgrass, have also been disturbed, as evidenced by the high percentage of reedgrass, Phragmites australis.

Except for the reedgrass, which may be displacing more desirable wetlands species, the marshes of Little Creek Cove are in good condition and provide valuable habitat for aquatic and semi-aquatic species.



SECTION VI. LITTLE CREEK COVE

#	PLACE NAME	ACRES	Sa		Jr		Md		Sb		Sc		OTHER		OBSERVATIONS	MARSH TYPE
			%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES		
418	Little Creek Cove	1.7	60	1.02			30	0.51	10	0.17				k,s	Fringe marsh	I
419	Little Creek Cove	14.7	50	7.35			10	1.47	assoc				40	q 5.88	Creek marsh, large reedgrass stands at higher elevations	I
420	Little Creek Cove	1.6	40	0.64			20	0.32	assoc				40	g,k,q 0.64	Partially diked, large amount of reedgrass	XII
421	Little Creek Cove	6.2	50	3.10			20	1.24	15	0.93			15	k,q 0.93	Fringe marsh, partially diked	I
422	Little Creek Cove	2.4	10	0.24	assoc		20	0.48	assoc				70	k,q 1.68	High marsh and ponds behind beach berm	VIII
	Total Section VI	26.6	46	12.35	assoc		15	4.02	4	1.10			34	g,k,q,s 9.13		
	Grand Total	1177.92	51	607.31	9	105.82	15	180.24	15	171.95	6	65.78	4	46.85		

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 Jr = Black Needlerush
 Md = Saltgrass Meadow
 Sb = Saltbushes
 Sc = Big Cordgrass

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